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ABSTRACT

Volume I, (Education Plan) of the Midterm Report is a detailed description of the goals, objectives, materials, and activities of the Fort Lincoln New Town (FLNT) elementary school curriculum and includes placement, recordkeeping, and reporting procedures; and provision for special education and pupil personnel services. References are made to Volumes II and III of the Midterm Report, the Idea Book, and other volumes prepared to guide the implementation of the Education Plan. The report concludes with Appendices A through I; the most important section (1) contains sample record forms. (For related documents see ED 047 171 through ED 047 188.) (Author/LS)

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GENERAL LEARNING CORPORATION
FORT LINCOLN NEW TOWN

MIDTERM REPORT
REVISED

NEGOTIATED SERVICES
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REPORT #3
VOLUME I

APRIL 6, 1970

GENERAL LEARNING CORPORATION • EDUCATIONAL SERVICES DIVISION
5454 wisconsin avenue, washington, d. c. 20015 1 east 54th street, new york, new york 10022

PREFACE

This report is a description of the OPEN PLAN for the Fort Lincoln New Town Education System. It describes the steps that must be taken between now and the opening of the First Facility as well as the processes involved in implementing and conducting the high quality education system mandated by the District of Columbia School System.

The OPEN PLAN actually consists of seven separate plans. They are described in three separate volumes:

Volume I	1. Education Plan
Volume II	2. Organization/Staffing Plan 3. Operations Plan 4. Community Participation Plan
Volume III	5. Facilities Plan 6. Funding Plan 7. Implementation Plan

CONTRIBUTORS TO THE EDUCATION PLAN

Joseph Lipson, Chief Consultant
Mary Millar, Senior Consultant

G. Ernest Anderson, University of Massachusetts
Brenda Bryant
John F. Byrne, Dade County, Florida Public Schools
Charlotte Cook
Carolyn Davis
Roy H. Forbes
Zigmund Grobowski
Jeanie Harris
Ronald Hasty
Susan Martin
Katherine O'Keefe
Gilbert Puente
Barbara Shafer
Pascal Trohanis
George Worle, University of Massachusetts

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The Education Plan

"The human mind is a mystery. To a large extent, it will probably always be so. We will never get very far in education until we realize this, and give up the delusion that we can know, measure and control what goes on in children's minds .... We do not need to keep picking away at their minds to make sure they are learning. What we need to do and all we need to do, is bring as much of the world as we can into the school and the classroom; give children as much help and guidance as they need and ask for; listen respectfully when they feel like talking; and then get out of the way. We can trust them to do the rest."

John Holt, How Children Learn, pp. 188-189.
Pitman Publishing Corporation, 1967.

1. EDUCATION PLAN

1.1 Introduction

The education plan of the Fort Lincoln School incorporates many recent developments in educational practice and technology. They were selected because they have been demonstrated effective in improving student learning and because they are consistent with the goals for the school set forth by the community and the school system. The most important components of the education plan are:

- An individualized instructional program
- A nongraded system of student placement
- The use of performance objectives as a basis for curriculum design and student evaluation
- The use of a high percentage of self-instructional materials
- Responsiveness to those most affected (students, parents, and teachers), and
- Continuous evaluation and revision of objectives, methods, materials, and all other factors related to the instructional process.

Each component of the education plan and the goals guiding the design and selection of procedures to support it will be discussed separately in terms of rationale and its impact on the instructional program. Then the basic framework of the education plan will be described. A bibliography of works documenting the rationale for selection of components is provided in Appendix A.

1.2 Major Components and their Rationale

1.2.1 An Individualized Instructional Program

Someone has said that although children can be taught in groups, they learn as individuals. Abundant research has been done in recent years to find out how people learn. The precise answer to that question still eludes us, but we have found that individuals learn in different ways. They differ in rate of learning -- some learn quickly, others slowly. They differ in rhythm -- some learn steadily, others have a staircase pattern of rapid gain followed by a period of consolidation. They differ in response to sensory stimulation -- some learn best from visual presentations, others from auditory. They differ in style -- some prefer to experiment and draw conclusions, others prefer to learn a principle and then apply it. These examples only skim the surface. The variables and the possible combinations of variables in learning methods are innumerable.

Since individuals learn differently, the Fort Lincoln Education Plan is designed to provide learning materials of varying levels of difficulty presented in a variety of ways. The materials will be arranged appropriately according to age and physical and mental development, but students will be able to select the materials and activities they determine to be of greatest help and interest.

The role of the teacher in an individualized program is to learn as much as possible about the learning and personal characteristics of each student by observing his behavior with peers and adults; by noting what activities he chooses when free to do so, what things he talks about, and what subjects he does best in; and by examining his errors in test situations and learning sequences to determine precisely what remedies are needed. Using this information as a guide, the teacher works with the student to select his own learning goals, suggests alternative activities and new possibilities, and acts as a resource for solving learning problems.

In an individualized program, each student acquires basic knowledge and skills in ways most effective and efficient for him and has the opportunity to choose to learn knowledge and skills unique to his particular interests and abilities.

This does not mean that students will work alone. Frequently they will be grouped with other students for instructional purposes when they are working on the same objectives. When students share common interests, elect the same group activity, or tutor other children a variety of grouping possibilities becomes apparent. Common to each, however, is the fact that they are temporary and task oriented, to be disbanded when the objective is accomplished.

1.2.2 A Nongraded System

In a graded school, children are grouped by age and are expected to master a certain quantity of information between September and June. The next September they are presented with another quantity of information, slightly more advanced, to master by June. Students move as a group from one grade to another. Students who fail to master a minimum of information in one or more subjects may be required to suffer repetition of all the information, mastered or not.

The nongraded school attempts to organize the school so that individualized instruction may take place. Not only do students vary from one another, but each student also varies within himself. Depending on his interests and abilities, a student may advance rapidly in reading and at the same time be struggling with mathematics. In a traditional school, where materials are available according to grade level, he would have difficulty with the mathematics materials and be bored by the reading materials.

Nongrading permits a number of things to happen. Students progress as they demonstrate readiness to learn new material. This accommodates slow and rapid learners as well as those who progress in spurts. Learning activity can be matched to the needs and characteristics of the individual student in a variety of combinations and at the appropriate difficulty level.

There is no one formula or set of standards for grouping children in a nongraded school. Each school adapting a nongraded system has applied the principles in a slightly different way. The theory underlying the nongraded system and numerous examples of how it has been applied are discussed in Nongraded Schools in Action by David W. Beggs, III and Edward G. Buffie, published in 1967 by Indiana University Press.

Nongrading alone does not solve educational problems, but it is necessary if individualized instruction is to become fully effective.

1.2.3 Performance Objectives

In the Fort Lincoln education plan, the term performance objectives refers to instructional objectives espressed in terms of student behavior. For example, a typical performance objective is stated thus: "The student will be able to convert fractions and decimals to percent and vice versa." Performance objectives are derived from educational goals. An educational goal is stated as: "All students will acquire the knowledge, skills, and attitudes necessary for continuing education and career advancement."

Performance objectives specify learning outcomes in the precise manner necessary to select the materials and activities required to help a student achieve the objective and to test for its attainment. The Activity Book contains examples of materials and activities which the teacher or student may select, to achieve an objective, depending upon his interests and learning characteristics.

Evidence for the value of clearly stated performance objectives is the fact that when students know the course or unit objectives they can often plan and execute their own learning programs with a high degree of efficiency and success. Another advantage is that performance objectives describe far more accurately than a letter grade what a student knows and is able to do. (Performance objectives are discussed in Section 1.4).

Writing performance objectives to describe the behavior required of a student to demonstrate that he possesses certain knowledge or skill is difficult. Specifying behavior that demonstrates possession of values and attitudes is extremely difficult. What does a person who is a good citizen do? Is he able to recite the preamble to the Constitution from memory? Does he contribute time and money to the political party of his choice? Does he work to protect the civil rights of his fellow citizens? Acknowledging the difficulty of writing objectives in this area explains why fewer objectives are available in subject areas such as social studies, music appreciation, and literature. But it also emphasizes the usefulness of objectives in guiding the selection of experiences to help students learn values and attitudes.

1.2.4 Self-instructional Materials

Most self-instructional materials have been prepared to help learners achieve precisely stated behavioral objectives. This simplifies selection of materials since the objectives describe what the outcome of using the materials will be. If these outcomes are appropriate, and if the self-instructional materials are prepared in a manner appropriate to the learners who will use them (reading level, prerequisite knowledge and skills), it is likely that use of the materials will be effective.

Self-instructional materials have other advantages which make them effective learning tools. When he uses them, the student becomes actively involved by being required to answer questions or make some other response at frequent intervals, and he immediately learns the results of his action. If he is correct, his right answer is confirmed. If he makes a mistake, he can find the cause of his error immediately and correct it before continuing.

Self-instructional materials, like the nongraded system, are consistent with the concept of individualized instruction. Students can work with self-instructional materials at their own pace. They don't have to wait for slower learners to catch up. If they stop to daydream, they won't get behind. If a teacher were presenting information, he might continue to explain even though the student has stopped listening; in contrast, the self-instructional material patiently awaits the student's attention. The materials are described in Section 1.5.

1.2.5 Responsiveness To Those Most Affected: Students, Teachers, Parents

A factor which contributes strongly to the maintenance of interest, involvement, and persistent effort is the degree of difference or the effect that results from this effort. Observe a youngster teasing his older sister. He soon stops and departs if she gives no indication that she is affected. However, if she shows she is affected by becoming angry, responding to his taunts, or bribing him to go away, he will take every opportunity to repeat the exercise.

This principle has been observed in designing the procedures to support the Fort Lincoln Education Plan. The use of self-instructional materials gives students control over learning activity. Also, it provides students the opportunity to make decisions about the other learning activities, materials, and methods they will use to achieve objectives. They will participate with other students in planning and executing projects. Students will be represented on committees and other groups concerned with the administration of the school. They will share responsibility for the consequences of their decisions.

Parents have a large stake in the education of their children. Their role in the total operation of the school is described in the Community Participation Plan, Volume II, Section 4. Details of their role in the education plan are contained in Parents' Role in the Instructional Program, Section 1.9 of this volume.

The system must also be responsive to teachers. Teachers at Fort Lincoln will determine the physical organization of the school, select and purchase instructional materials, plan and implement their own staff development program, and share in making other decisions relating to the operation of the school. For a full description of the teacher's role see Volume II, Section 2, Organization/Staffing.

Obviously, a system that is responsive to the needs of those who are affected by it also is one that accommodates individual differences. The mechanism by which individuals or groups will affect the system is negotiation -- making arrangements by mutual discussion. The design of the Fort Lincoln system assumes that negotiation is the best way to protect the rights of all individuals.

1.2.6 Evaluation and Revision

Both formative and summative evaluation will be incorporated into the Fort Lincoln Education Plan. Formative evaluation will require gathering data while the program is being implemented and providing periodic feedback to the staff in order to detect and predict areas needing improvement. The overall strategy will be to monitor on a continuous basis the potential sources of difficulty in the system. The daily records of student performance on specific objectives using various materials will be available as well as data gathered by observation and group experiences concerning the objectives, materials, tasks of the staff, and procedures for the school operation (See Appendix I).

From the detailed data generated, information can be summarized regarding:

- Rate of student progress toward achieving specific objectives.
- Appropriateness of specific materials for reaching the objectives.
- Correlation between student performance on criterion referenced tests for objectives and the materials used to achieve the objectives.
- Minimal proficiency levels required for performing an objective to ensure success in future objectives in the same sequence.

Data required to analyze a specific problem of implementing the program will be summarized by the staff as needed. Additional information regarding objectives, materials, and procedures will be summarized yearly for staff analyses and decisions.

Summative evaluation consists of a summary assessment of the overall value of the program. Criteria associated with the objectives of the program are measured, and the measurements are then compared to established standards.

Thus, after the Fort Lincoln First Facility has been in operation two to three years (in order to permit sufficient time to fully implement the program and conduct formative evaluation) and periodically thereafter, the program can be assessed to determine the degree to which the education system design criteria have been met. Considerations would include the extent of individualization, student performance, community perceptions of the school, staff functions, appropriateness of objectives and materials, and ease with which the school program operates. Such summative evaluation can be provided from the data continually kept at the school. The Midterm Report, Volume 3, Operations, treats the plan and instruments for obtaining these data. An evaluation made by persons independent of the Fort Lincoln Schools and the D.C. Public Schools is also advisable to ensure objectivity and acceptance of the evaluation by those not connected with the Fort Lincoln Schools.

1.3 Framework of the Education Plan

1.3.1 Schedule

The first elementary school to be built in the Fort Lincoln site is designed for 700 children aged 3 to 12. The instructional program will operate 12 months a year, 6 days a week from 7 a.m. to 7 p.m. Students will attend the school, on the average, 180 days a year, 10 months a year, five days a week. Specific vacation time, arrival time at school, and length of daily attendance will be matters of individual choice. As a general guide, children aged 3 to 5 will attend approximately 3 hours a day; children aged 6 to 12 will attend approximately 5 hours. The length of the school day and year has been extended to be responsive to the needs of the population served by the school and to ensure the most efficient use of the facilities.

1.3.2 Grouping by Stages

For instructional purposes, children will be grouped in four stages, roughly according to age, developmental characteristics, and instructional activities. (See Volume III, Section 5, Facilities Plan, for a detailed description of the physical environment.) The stages have been set with the expectation that there will be some overlap depending on the maturity, interests, and abilities of individual students.

The stages are:

STAGE	AGE RANGE	APPROX. NO. OF STUDENTS
I	3-5	175
II	5-7	235
III	7-9	290
IV	9-12	

Stages III and IV have been combined in the same area of the building because activities of children in each stage are similar. However, because children aged 7-9 and 9-12 differ significantly in maturity and experience, the distinction between the two stages should be preserved to facilitate selection of appropriate instructional activities and assessment of programs. Section 1.8, Criteria for Assignment to Stages, specifies the performance criteria distinguishing these stages.

Teachers will be selected and assigned to stages on the basis of their specialties and according to the activities that are to be emphasized. For example, a teacher with special preparation or experience in reading would be assigned to Stage II. A teacher with special preparation in science would be assigned to Stage III and IV. (See the Organization/Staffing Plan in Volume II for descriptions of staff qualifications and pattern of organization.)

1.3.3 Space and Equipment

Within each stage, areas will be established according to activity and/or subject. (See Facilities Plan, Volume III, Section 5.) In Stage I, activities related to painting, working with clay, making objects of papier-mâché, and the like, would be located in areas with a sink and an easily washed floor. Other areas will be arranged and equipped for dress-up play, climbing and other large-muscle activities, housekeeping, and building with blocks.

Audiovisual equipment located in Stage I includes Language Masters, typewriters, tape recorders, record players, and electric typewriters. At least one typewriter will have a remote control on-off switch to conduct special learning activities aimed at developing reading skills. These activities are described in detail in The New Nursery School by Glen Nimnicht, Oralie McAfee, and John Meier.*

In Stage II and Stage II-IV, physical areas will be established primarily according to subject: reading, mathematics, art, science, and social studies. Learning materials and student records associated with each subject will be located in the corresponding areas.

Also in these stages some space will be allocated for general purposes: small quiet areas for individual and small-group work, carrels arranged for convenient use of audiovisual equipment, storage of frequently used books and reference materials.

A Resource Center will function as a source of information and learning experiences. It will house the customary library materials as well as films, filmstrips, cassettes, transparencies, tapes, and equipment to supplement the Stage resources.

When students are in the Resource Center, they can carry out assigned study, work on independent projects, or simply browse. They will use the Center for displaying their own work, learning to operate the audiovisual equipment, producing audiovisual materials, learning the procedures of the library, or working with the Media Coordinator to prepare a group presentation. An efficient Resource Center whose materials are constantly updated will help bring about a vast number of learning experiences.

The Equipment List as completed is an indication of the variety and number of instructional opportunities that will be available to Fort Lincoln students.

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* Published by the General Learning Corporation in 1969.

Under the guidance of teachers, each student can select the most appropriate tools and resources to help him discover and develop his unique interests and abilities.

The Idea Book filled with suggestions for implementation of the Fort Lincoln Education Plan and areas to investigate for further resources would logically be kept in the Resource Center since it would be of interest to all teachers.

1.4 Goals and Objectives

The goals and objectives of education have long been the subject of interest and study by educators, leaders in government, and individuals and groups representing the general public. Statements from these sources concerning the goals of education, though phrased differently, show a high degree of similarity. This is one typical statement:

> "The basic American value, respect for the individual, has led to one of the major changes which the American people have placed on their school: to foster that development of individual capacities which will enable each human being to become the best person he is capable of becoming."[1]

Planners for the Fort Lincoln education system took this goal one step further by defining quality education:

> "Quality education is defined as one which enables each individual to maximize his ability to function in his roles as an individual, as a family member, and as a citizen in a community and in the work world."[2]

The educators of the D. C. school system extended the definition of quality education to a mandate for a curriculum in the Fort Lincoln schools that would provide to every student the opportunity for:

- Acquisition of the knowledge, skills, and attitudes necessary for continuing education and career advancement.
- Development of personal talents and interests.
- Growth in social participation.
- Growth in positive self concept and sensitivity to others and to the environment.

Such statements describe the goals toward which an education program should be aimed, but leave unanswered the questions of how the goals shall be achieved and how the fact of their achievement shall be recognized. Specifically, what subjects should be taught to the Fort Lincoln students aged 3 to 12? What knowledge and skills do they need to function as individuals, family members, citizens, and workers? By what methods and with what materials should the knowledge and skills be taught? How will their achievement be measured? Statements more precise than goals are needed to plan an education program and evaluate its outcomes. These statements are called objectives.

Mager describes an objective as "a statement of what the learner is to be like when he has successfully completed a learning experience. It is a description of a pattern of behavior (performance) we want the learner to be able to demonstrate."[3] He outlines three reasons objectives are important:

- As a basis for selecting appropriate materials, content, or instructional methods.

  > "After all, the machinist does not select a tool until he knows what operation he intends to perform. Neither does a composer orchestrate a score until he knows what effects he wishes to achieve. Similarly, a builder does not select his materials or specify a schedule for construction until he has his blueprints (objectives) before him. Too often, however, one hears teachers arguing the relative merits of textbooks or other aids of the classroom versus the laboratory, without ever specifying just what goal the aid or method is to assist in achieving."

- As a basis for determining the degree to which the learner is able to perform in the prescribed manner.

> "Tests or examinations are the mileposts along the road of learning, and are supposed to tell the teacher and the student the degree to which both have been successful in their achievement of the course objectives. But unless goals are clearly and firmly fixed in the minds of both parties, tests are at best misleading; at worst, they are irrelevant, unfair, or useless. To be useful they must measure performance in terms of the goals."

- As a basis on which the learner may evaluate his own progress.

> "With clear objectives in view, the student knows which activities on his part are relevant to his success, and it is no longer necessary for him to 'psych out' the instructor."

For these reasons, the use of objectives can contribute to improved quality of instruction. Therefore, the Fort Lincoln education program was designed on the basis of behavioral objectives.

Writing objectives is a technical skill that can be taught and refined with practice. The selection of objectives — the determination of what objectives are most relevant and essential for an instructional program — is a matter of judgment. This judgment should be exercised by parents, students, employers, teachers, and other members of the community in which the instructional program is set. The objectives chosen as a point of departure for the Fort Lincoln education plan reflect the judgments of these groups as expressed in planning documents, contracts, and community surveys related to the Fort Lincoln project. They are grouped in four categories: required terminal objectives, optional terminal objectives, intermediate objectives, and criterion objectives for progress from stage to stage.

1.4.1 Required Terminal Objectives

Objectives related to the most frequently expressed goals for the Fort Lincoln education plan are classified as required terminal objectives. For example, for an average sixth grader, required terminal objectives would be established in reading, mathematics, communications skills, and health — knowledge and skills basic to meeting the life-long needs of every individual. All required terminal objectives must be achieved by every student for completion of the program. A typical required terminal objective in communications skills is: "The student will write an original paragraph consisting of grammatically correct sentences and appropriate conventions of punctuation." (See Objectives Book.)

1.4.2 Optional Terminal Objectives

Since interests and capabilities vary from student to student, the school must provide a wide range of experiences to allow each student to discover and develop his unique abilities. Therefore, a number of optional terminal objectives have been specified. (See Objectives Book.) An optional terminal objective is one selected by the student. Every student will select some optional objectives in every subject area. Optional terminal objectives have been specified for science, social studies, physical education, and arts and humanities. An example from social studies: "For any item the student chooses, costing more than $50 he will (1) price the item in three different stores; (2) calculate the cost of a bank loan to cover cost of purchase if repaid in 6 months; (3) calculate the cost of charging the item and paying for it in 6 monthly installments; and (4) rank in ascending order of cost the 3 methods of payment: cash, bank loan, credit."

1.4.3 Intermediate Objectives

An intermediate objective is prerequisite to achieving a terminal objective, either required or optional, and serves as a basis for selecting learning materials and prescribing learning activities. Intermediate objectives are specified and sequenced from simple to complex. (See Objectives Book.) Examples of intermediate objectives for the required terminal objective, "The student will write an original paragraph consisting of grammatically correct sentences and appropriate conventions of punctuation" are:

Stage I:	"Coordinates eyes and hands in aligning objects, pouring liquids, fastening, locking, threading, and lacing."
Stage II:	"Writes in manuscript all upper and lower case letters on primary paper."
Stage III:	"Places period, question mark, or exclamation point at the end of appropriate sentences that use reading vocabulary.
Stage IV:	"Writes in simple, compound, and complex sentences with regard to punctuation."

1.4.4 Criterion Objectives

Certain minimal academic and developmental performance objectives have been specified to guide the placement of a student in the most appropriate stage. See Criteria for Assignment to Stages, Section 1.8 for a complete discussion.

1.4.5 Discovery Objectives

A comprehensive list of objectives, developed by Universal Education Corporation, has been selected primarily to guide the teacher in observing the development of a child. These objectives emphasize development of basic learning skills in such areas as reasoning and problem solving, work and study skills, communication, self-confidence, and reading readiness. (See Objectives Book.)

The usual behaviors exhibited by a child who has these skills have been adapted into observation checklists (See Figure J, Appendix I, for a sample checklist). If these behaviors do not appear, or appear inconsistently, as a child interacts with the available materials and learning activities, the teacher can prescribe specific materials and experiences designed to encourage development of the lacking skill.

1.4.6 Availability, Development, and Revision of Objectives

Although the value of objectives as a basis for instructional programs is widely recognized, objectives are not widely used for this purpose. The difficult and time-consuming nature of the task of writing objectives is the main reason for their minimal use.

In order to have a program ready for the opening of school in September 1970, it was expedient to locate, examine, and select objectives that had already been developed. In mathematics and reading, terminal and intermediate objectives specified to a very fine degree of detail are available. Among the subject areas designated as optional, objectives which have been developed to a comparable degree are available only in science.

Terminal objectives have been developed for communications skills and health in the required areas, and social studies, physical education, and arts and humanities in the optional areas. Intermediate objectives have been developed in sufficient detail to guide the selection of learning materials and activities in all stages. Further refinement must be done by the teachers in the operating school.

By the time Fort Lincoln School is ready to open, it is highly probable that resources will be available to assist the teachers in preparation of more refined intermediate objectives. The Center for the Study of Evaluation (U. C. L. A.) has organized an Instructional Objectives Exchange. To prevent duplication of effort, they are collecting and cataloguing instructional objectives that have been written by teachers round the country. Other teachers can draw on this bank of objectives, select the ones most suitable for their students, and obtain test items prepared specifically for those objectives. A description of this service and the procedure for participation are contained in Appendix B.

It must be emphasized that the objectives selected for the opening of the Fort Lincoln education system should be considered a point of departure. They must be reviewed periodically to determine whether they are relevant to the needs of the students. Student performance in school and after leaving Fort Lincoln, changes in the community, and other indicators will provide a basis upon which the objectives will be modified.

All objectives are contained in the volume titled Objectives for Fort Lincoln Elementary School (Objectives Book).

1.4.7 Affective Domain

The utility of specifying behavioral objectives for social skills and positive self-concept, those areas dealing with values, beliefs, and attitudes, is questionable. Behavior which implies the existence of certain attitudes can be described, but the attitude or belief which prompts that behavior remains speculative. For example, it could be inferred that an individual who does not steal or go through stop signs respects the law. However, fear of getting caught rather than respect for the law may be the real motive for the behavior.

Assuming that behavior which accurately reflects values and beliefs a person holds could be specified, other questions need to be answered. Is there consensus about the values that should be taught? Are these the values that will be needed for survival in future years? Do words like honesty, loyalty, and brotherhood have absolute meanings? Is there a typical behavior for each of these values?

Another question: "How are these values taught?" There is no evidence that they can be taught directly. Memorizing and reciting the salute to the flag is no guarantee of patriotism; visiting an art gallery does not necessarily promote appreciation of fine painting; studying the customs of another culture does not automatically foster feelings of brotherhood.

There is some evidence that we do learn values from the example of others (especially those we love or admire), from the consequences of our behavior, and from the way others treat us. Personal recollection will provide many illustrations.

The elements of the elementary school plan such as physical environment, instructional materials, the administrative organization, and the specifications for staff selection have been selected to promote positive growth in self image and social skills. A few examples of how the program design contributes to learning in the affective domain follow.

- Architectural features and furniture are scaled to the size and strength of a child; open space permits freedom of movement; textures and colors are chosen to convey warmth and comfort. This setting fosters independent action, feelings of control, and exploration and manipulation of the environment with safety.
- The instructional approach is child-centered; materials are primarily self-instructional, responsive to manipulation, and self-correcting. Discovery learning is encouraged. The child can proceed at his own pace with a high probability of success. Some materials such as games and science programs encourage cooperation between and among students.
- Students are represented in groups responsible for school operation; students participate in selecting their own learning

objectives and materials and, as appropriate, are responsible for scoring their tests and keeping records.

- People will be recruited for staff positions who treat other people with consideration and respect and who are themselves self-respecting, open, curious human beings as well as skillful, qualified teachers. For a complete discussion see Volume II, Section 2. 7, General Criteria for Selection.

Objectives for the Fort Lincoln school which can be directly classified in the affective domain will be found in the Objectives Book: Discovery objectives 19, 26, 27, and 33 and Social Studies objectives 1 through 12. Some of the Arts and Humanities objectives relate indirectly to self awareness and some of the Communications Skills objectives relate indirectly to social participation and awareness of others.

The bulk of student learning about values, beliefs, and attitudes will occur in daily contacts with adults and peers and participation in school management. Some specific materials and activities which encourage students to examine and discuss these areas and to learn who they are have been recommended for purchase, listed in the Activity Book, or mentioned in the report. A few examples are listed for each stage.

- Stage I

  Mirrors - full-length and hand
  My Home and Family Activity Kit
  My Face and Body (flannel board)
  Understanding Our Feelings (photographs)
  Various dolls and puppets

- Stage II

My Home and Family Activity Kit
Films and photographs
  Understanding Our Feelings
  Fathers Work
  Mothers Work Too
  They Need Me

Materials described in the Description Book, Stage II
*Words and Action
*Selected Kinder Owl Books
  David Was Mad
  All Kinds of Neighbors
  Let's Talk About the World

Man in Action Series
  People and Their Actions
  People and Their Social Actions
  People and Their Actions in Social Roles

Children of the World Books

- Stages III-IV

*NEA Unfinished Stories - What Will ________ Do?

*Selected Young Owl Books
  Growing Up
  Growing Older
  My Turtle Died Today
  The Old Man in Our Block

*Simulation Games such as
  Community Response Game
  Life Career Game
  Game of Democracy

*See Description Book, Stage II-IV.

1.5 Selection of Materials

The student behavior specified in any objective, whether terminal or intermediate, indicates the knowledge and skills the student must have to behave as the objective states. The behavior specified in a terminal objective is stated in terms of what an average student should be able to do by the end of the elementary school program. The behavior specified in an intermediate objective (derived from the terminal objective) is stated in terms of the knowledge and skills prerequisite to the terminal objective. The behavior may be simple or complex depending upon the age and previous learning of the child.

When the intermediate objectives have been specified, the next step is the selection of appropriate materials. The materials and activities selected are those which will help the child develop the knowledge and skills specified in the intermediate objectives, and ultimately, in the terminal objective.

Several materials that have been carefully designed, field tested, and revised are available, encompassing entire curriculum areas for the total elementary school program. A number of these programs will be discussed in the following sections. They are recommended for consideration by the Fort Lincoln School because:

- Some of the materials were specifically written to be used to achieve objectives that have been adopted as a basis for the design of the Fort Lincoln education system curriculum. By using the related learning materials, Fort Lincoln students will be provided with a nucleus of sequenced learning activities precisely matched to the objectives in three curriculum areas — reading, math, and science.

- The materials were developed by highly competent and respected subject-matter experts and educators, and their effectiveness in helping children in a variety of schools has been demonstrated.
- The materials are self-instructional, allowing students to move at their own pace, receive immediate feedback, and evaluate their own progress.

1.5.1 Individually Prescribed Instruction

The IPI programs consist of highly refined performance objectives in reading and mathematics, worksheet activities which match each objective, and pretests and posttests for each unit or intermediate objective. The materials are finely sequenced and are self-instructional. The IPI reading program incorporates the Sullivan reading materials. Required terminal objectives for the Fort Lincoln program in the areas of mathematics and reading were derived from IPI objectives.

The IPI materials were developed by the Learning Research and Development Center (LRDC) at the University of Pittsburgh[4], had their first trial in nearby Oakleaf Elementary School, and are disseminated to other schools by Research for Better Schools, Inc. (RBS). RBS has established procedures for conducting the dissemination program; for example, the IPI reading program cannot be implemented in a school until that school has used the mathematics program for one year.

A school wishing to adopt IPI materials must meet the following selection criteria:

- Administrative Commitment -- The School Board, Superintendent, and principal should have a thorough, first-hand knowledge of the essential elements of Individually Prescribed Instruction (IPI) math. They should also be fully informed of the administrative requirements of the program.

- Teacher Commitment — Teachers must be involved in the selection of IPI math for their school to ensure the high level of teacher commitment which is so important to the success of the program. This should include representative faculty visits to IPI demonstration schools and thorough briefings on the elements of IPI and its implications.
- Need For Retraining — There is a significant need for both administrator and teacher retraining when a district adopts IPI math. The district should be fully aware of the nature and extent of this training.
- Research Participation — Both administrators and teachers should know in detail the research questions that are being asked, the kinds of data that will be collected, the method of data collection, and the work involved in that operation. They should also be aware of the need for attitude surveys to be conducted with both teachers and students, the possible request for additional achievement testing, and other contingencies which make demands on school personnel.
- Uniqueness of Situation — Here we ask whether the school is ready for individualization. This involves consideration of the

individual school history. Has the school been involved in innovation? Has it attempted in any way to prepare for individualized instruction? Does the school present a suitable climate for Individually Prescribed Instruction?

RBS instituted these criteria to ensure that dissemination projects will be consistent in all respects with the model developed by LRDC. This consistency is essential to ensure program effectiveness and to continue collecting data and conducting research for program improvement and extension. The Fort Lincoln Education Plan assumes that no one learning method, strategy, or program will meet the needs of every student. A variety of alternative approaches, materials, and activities must be available for use in achieving the same objective.

Indications are that the conditions established by RBS will be modified with time and experience. If the Fort Lincoln School is put into operation before these modifications have been made, the staff will want to give careful consideration to the impact of the RBS criteria on the Fort Lincoln program before electing to use IPI materials. Possibly RBS would recognize Fort Lincoln as a special case requiring special arrangements. Fort Lincoln staff might consider the increasing availability of materials based on IPI principles but offering more flexibility in format and administration.

The IPI mathematics materials are supplied by Appleton-Century-Crofts at a cost of approximately $12 per student. The cost of implementing the program also includes salary and travel expenses for the principal to attend the two week RBS training session,salaries for teachers attending summer training sessions at their school, and teacher training materials.

A detailed discussion of the development and the characteristics of IPI and an address for obtaining further information are contained in the Descriptions Book, Stage III.

1.5.2 AAAS Science Program

The early sections of Science — A Process Approach[5] provide instruction in science for the primary grades which emphasizes the development of competence in skills basic to further learning. These processes are called Observing, Using Numbers, Measuring, Using Space/Time Relationships, Classifying, Communicating, Inferring, and Predicting. The child is introduced to a variety of content in acquiring these skills. By the end of the third grade the child who has been instructed using this program has acquired some important fundamental process skills, a good many basic scientific concepts, and some organized knowledge about the natural world.

The exercises of Science — A Process Approach are arranged to provide an orderly progression of learning experiences. The objectives — the student performance expected by the time each exercise is completed — are clearly specified. To ensure that these objectives have been attained, two competency measures — one to be administered as a group measure and one to be administered to individuals — are included with each exercise.

1.5.3 Other Curriculum Programs

A number of other curriculum programs in reading, mathematics, and science meet the criteria listed in Section 1.5. They differ from the IPI materials in cost, content emphasis, scope and sequence, format, and/or administrative procedures.

The more alternatives available to students and teachers in planning an individualized learning program the better. It is suggested that during Phase I (see Volume II,Section 2. 8) teachers review the programs described in this report and any others they know of, and purchase at least two in each subject area (reading, mathematics, science) for the opening months of school. Additional programs could then be purchased and installed at a later time.

Many currently available reading programs use only paper and pencil presentations to teach basic skills. The Michigan Language Program, developed at the University of Michigan, and published by Learning Research Associates, Inc. , offers a new approach to teaching reading in its use of audio and visual materials — tapes, transparencies, teacher-led and group activities. A thorough discussion of all elements of this program is included in the Descriptions Book, Stage II.

The Wisconsin Research and Development Center for Cognitive Learning has developed a system of reading skill development under the direction of Wayne Otto. The process of developing this system has resulted in a scope and sequence statement of reading skills, assessment procedures and group placement tests, and instructional materials keyed to the reading skills. The research for this project was supported in part by funds from the U. S. Office of Education. Excerpts from one of the project reports are contained in Appendix F with the outline of skills and the objectives for Word Attack, Levels A and B.

The Individualized Mathematics System (IMS) being developed under the direction of Frank Emmerling of the Regional Education Laboratory of the Carolinas and Virginia parallels the IPI mathematics program in sequence and scope. Emphasis in IMS materials is on accommodating diverse learning styles and using a wide variety of materials. Funds to support the development of these materials were contributed by a number of school districts surrounding the regional laboratory. The printed materials will be laminated in plastic so they can be reused. The IMS program is scheduled for completion early in 1970 at an estimated cost of $4 per pupil. See Appendix F for a complete description of the materials.

When the Fort Lincoln School first opens, only the students in Stage I will have little or no previous school experience. Students in the upper grades will vary widely in the degree to which they have mastered fundamental concepts and skills. Sullivan Associates has published a series of eight books for students in fourth grade and above who need remedial instruction in basic mathematics skills. The characteristics of this programmed series are included in the Descriptions Book, Stage III.

Some students have a preference for certain methods of presentation. Sullivan Math is a paper and pencil program. Electronic Learning, Inc. is developing a series of audio-tapes in cassette form with accompanying worksheets. Appendix F contains a description of the components of the program and a list of available and projected lessons.

In recent years a number of science curriculum programs have been developed. Science — A Process Approach is mentioned in Section 1.5.2. Other programs are:

Conceptually Oriented Programs in Elementary
  Science (COPES)
Elementary Science Study (ESS)
Inquiry Development Program (IDP)

Minnesota Mathematics and Science Teaching
Project (Minnemast)
Science Curriculum Improvement Study (SCIS)

A table comparing the major characteristics of these programs is contained in Appendix F.

The programs mentioned above each focus on one subject area. Other efforts in curriculum innovation are directed toward all subject areas. Project PLAN and the UNIPAC's from Materials Dissemination Center are examples of this broader approach.(Both are described in Appendix F.)

Project PLAN (Program for Learning in Accordance with Needs) is an array of teaching-learning units (TLU's) which are prescribed for a student in a manner similar to that planned for Fort Lincoln (see *Diagnosis and Prescription*, Section 1.6), except that a computer is used to store and process student data. TLU's have been developed in reading, mathematics, social studies, and science..

Project PLAN, under development since 1967, is now being distributed by Westinghouse Learning Corporation and is available only on a school-wide basis at an annual cost of $100 per student. This cost includes TLU's, objectives, computer terminals (one for every 500 students), and consultant services. The consultant services are provided by a field representative who conducts an in-service training program the Spring before the PLAN program is implemented, updates training during the summer, and provides intensive support during implementation in the Fall including an hour by hour schedule for the first five days of school. The field representative is then on-call throughout the year to troubleshoot and conduct follow-up in-service training. The recommended purchase unit for PLAN is approximately 1000 students and 30 teachers.

The PLAN program is consistent with the design of the Fort Lincoln Education Plan. If it were possible to purchase selected TLU's matched to Fort Lincoln objectives, incorporation of PLAN would be no problem. Since the entire program must be purchased, its value should be carefully considered relative to its impact on the flexibility of the Fort Lincoln plan. Additional information about Project PLAN appears in Appendix E.

1.5.4 Other Curriculum Materials

In support of and in addition to self-contained curriculum programs, other materials have been selected. A variety of activities should be available because:

- Children learn differently, and varied alternatives must be open to them.
- Children may need review or additional practice with a skill.
- An environment rich in materials encourages exploration and motivates the learner.

These materials have been indexed to the appropriate intermediate objectives. Priority is given to selection of materials that are self-instructional, are of demonstrated effectiveness, and require presentation formats other than paper and pencil. Activities and materials, for example, include printed matter, films, records, games, manipulative devices, Fort Lincoln site resources, D. C. Public Schools curriculum resources, or metropolitan area resources.

Ecology and technology materials are related to appropriate objectives in other subject-matter areas because of their interdisciplinary nature. For example, the "splash board" experiment, as outlined in the ecology materials, demonstrates how the earth is shaped by natural phenomenon such as rain. Children watch the effect of rain on the soil as it splatters mud on an upright board. Execution of this experiment requires many other skills which are specified in objectives for other subject areas. These skills include such things as measurement (mathematics), observation and recording of data (science), and preparation of reports of findings (communications skills). An example from technology that has numerous applications in other curriculum areas such as creative writing, reading, mathematics, and social studies is the actual publication of a newspaper.

The terminal objectives and the intermediate objectives are contained in one volume, the Objectives Book. The related activities, coded to the objectives, are listed in a second volume, the Activities Book. Many copies of these books should be available throughout the school for convenient use by students and teachers. When an intermediate objective is selected from the Objectives Book, an appropriate activity, taken from a list in the Activities Book keyed to that objective is entered on a short-term prescription sheet. The activity then becomes one of the students' assignments.

The activity lists include the intermediate objective to which the activities are coded, the title, publisher, or source of the material, and the location of the material in the school. A place for remarks allows the activity to be further defined. Sample pages from the Activities Book appear in Appendix E. The coding or numbering system is explained in the beginning of the Objectives Book.

1.5.5 Curriculum Innovation

The flexible nature of an individualized instructional program offers advantages to the teacher as well as to the student. New curriculum programs can be evaluated with a small sample of students and a number of different types of learners to determine their relevance and effectiveness. Analysis of student responses will provide data to make this determination. In addition, formal student evaluation of the interest of the presentation, the relative level of difficulty, and the usefulness of the information learned can be sought. Through these procedures, students will be given the opportunity to make a real contribution to improving the instructional processes of the program.

The uniqueness of the Fort Lincoln Education Plan is likely to attract the interest of curriculum development specialists round the country who want a place to test new materials. Participation in activities of this sort (carefully planned to avoid disruption of student learning) will constantly refresh and update the Fort Lincoln curriculum.

As worthwhile curriculum projects become available, Fort Lincoln teachers may wish to investigate the possibility of purchasing them for the new school.

1.6 Diagnosis and Prescription

1.6.1 Rationale

The determination of instructional methods for FLNT students must be based on school objectives and the child's performance in the school. Instructional strategies vary according to the needs of the individual. It is desirable to diversify instructional strategies even for one student to provide variety, and to get him to try new and different ways of learning and acquire new learning skills. The key strategy is to continue methods and processes which show evidence of effectiveness and at the same time to explore new and different activities which may offer even greater results. But if the parent, the teacher, or the student are unhappy with the student's development, then strategies must be markedly altered in an attempt to provide a better rate of development.

For example, consider a problem in arithmetic such as learning to multiply single digit numbers. The student can learn this in the context of a practical problem such as counting out numbers of seeds to be used in a science experiment or deciding how many teaspoons of sugar are needed for a cooking recipe or he might learn it in the context of a specific arithmetic lesson using pencil and paper materials and exercises. He might learn multiplication in connection with various academic games such as variations of rummy and cribbage.

How is the teacher to decide whether the student should work with instructional materials closely related to the objective (e.g., multiplication flash cards) or whether the student should spend time with loosely related materials such as science experiments, practical arts activities, and academic games? Any strategy decided upon will require considerable discrimination and effort on the part of the teacher. The strategy problem is much like the problem of a track coach and a runner. Together they must arrive at a program which puts the athlete in winning form, but it is not always clear that the choice made is the best one or that something that didn't work last week won't work this week. Eventually, the evaluation comes from a sense of satisfaction with the training activities and the trials as well as evidence of both personal improvement and improvement in relation to other athletes in the same class. Similarly, the teacher in the Fort Lincoln School must be alert to signals from the student.

In addition, the teacher must make sure that all information is treated with a fair amount of skepticism in order to avoid stereotyping the student in terms of ability. The intuition, common sense, and experience of the teacher can be a useful guide in the match of students to objectives and to materials. However, a feedback system is needed so that the teacher's prescription does not become a self-fulfilling prophecy. The teacher's decisions must be discussed, evaluated, and criticised on the basis of evidence. See Volume II, Section 2.9 for a description of staff evaluation procedures.

1.6.2 Procedures

There will be two types of diagnoses and prescriptions for students: long and short term. The long-term diagnosis and prescription consists of an assessment of present learner characteristics and selection of appropriate objectives for his instructional program.

The long-term diagnosis and prescription is done by the teacher at approximately three- to five-month intervals. A series of short-term diagnoses will take place within that interval to ascertain student progress and revise plans where necessary.

In making a diagnosis, the teacher reviews information and experiences that have accumulated in the student's permanent folder and stage folder since the previous diagnosis and prescription. (These folders are described in Appendix I.)

From the permanent folder the teacher will obtain information about family background, health and medical history, achievement in a prior stage, progress toward achievement of terminal objectives for the stage the student is in, and the previous long-term prescription. From the stage folder which the student keeps with him, the teacher will obtain information about current interests, behavioral characteristics, time spent using various instructional media, and learning objectives completed to date.

On the basis of the assessment of this information, a long-term prescription will be written for the student specifying the instructional activities and time range expected to be spent on such activities.

The teacher has primary responsibility for long-term diagnosis and prescription with final planning and consultation being done in conference with the student's parents. Decisions for Stage III and IV students are also discussed with the students. For Stage I and II students, part of the diagnosis is the determination of when the student is to be included formally in the instructional planning.

A general form will be used to record long-term prescriptions including the decisions for curriculum areas to be considered and specific behavioral development of the student. The original long-term prescription form will be kept in the student's permanent folder. A duplicate will be placed in the student's stage folder.

The long-term prescription form provides a place to record the particular curriculum areas for which objectives are to be completed. Both the subject area and the specific objectives will be listed along with an estimate of the amount of time required for completion. A long-term prescription need not include all subject areas. A teacher may choose to omit objectives in a certain curriculum area, perhaps because the student has mastered the requirements for the stage or because the student has experienced considerable frustration with certain objectives and should have a major change of activity.

The type of activities or materials to be emphasized (films, group project, programmed instruction) will depend on the student's psychomotor skills, learning style, and previous tendency to use certain types of materials. The same or different types of activities may be prescribed for different subject areas.

Student choice should also guide the selection of activities and materials. However, this is not an infallible or exclusive guide because the student may choose what he is used to and comfortable with -- not what he would enjoy most, be challenged by, or learn the most from. He may choose what he thinks he is expected to choose by his parents, the teacher, or his peers. He may choose out of ignorance. Nevertheless, student choice may pay dividends if properly offered and evaluated.

Space is provided on the form to note prescription revisions or student progress, if they require comment, at the periodic reviews. Otherwise, the teacher may simply cross off specific parts of the long-term prescription as they are completed. Other comments related to the prescription such as parental requests or particular developmental characteristics that require consideration in working with the student (ability to accept criticism; tolerance of other people's ideas) can be noted in the space provided for comments. Depending upon student development and progress, more than one prescription sheet per year may be required, or a continuation sheet may be attached to the initial prescription sheet.

When evaluation of student progress indicates the need to revise a prescription, these factors should be considered:

- A sense of satisfaction on the part of the student with his daily work and activities.
- Evidence of persistence, transfer, and carry over of what he has learned to self-chosen activities.
- Relative and absolute improvement in performance.
- Satisfaction of parents, teacher, and (perhaps) an outside evaluator with the performance and progress of each student.

The longer the student is in the school, the more information there will be accumulated about him. Theoretically, decisions should be easier to make and more accurate as more information is accumulated. However, the increasing information also tends to produce certain dangers which must be fought by quality control, sensitivity, and effort on the part of the teacher. A teacher must be alert to avoiding stereotyping, being swamped by information and duties, and becoming complacent because a student does not actively show signs of dissatisfaction.

The long-term diagnoses and prescriptions are supplemented by short-term diagnoses and prescriptions which can be made by the teacher, student or aide at the discretion of the teacher. The frequency of the short-term review will vary with the needs of individual students.

The diagnoses and prescriptions are prepared by the teacher to help the student achieve at least the minimum terminal performance objectives in a manner most beneficial and appropriate to him. In addition, the student will be able to exercise options about how he spends part of his day in school. For personal options the student can use any existing prescription forms to plan his own program or devise his own way of developing a plan. Since the development of such a plan is a student option, the teacher will be involved only when the student asks for help with the plan. The task of the teacher in such cases is to encourage the student to explore and try new learning activities in order to make him more competent as a learner and because a new learning activity may prove to be extremely effective.

1.6.3 Response

Records are emphasized at Fort Lincoln to be used as a tool in communication, not as an effort to minimize personal contact between teacher and student. The information recorded in the records can only be put there by the student or an adult observer. The purpose of the records is to aid the people who guide the student, including the teacher, the student himself, and the parents. Records also serve as a means of measuring progress.

Even with an emphasis on the use of records, descriptions of existing Open Plan schools[1] indicate that the personal interest of teachers is very much in evidence. For example, teachers at Racine Wisconsin's Winslow Elementary School decide as a team how "each child's needs can be met as well as possible."

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[1] Behrendt, David. "Away With Tradition," American Education, January - February 1970, pp. 18-22.

Such joint decisions have the advantage that "You can sit down and talk about a child and see what he needs; says Caroll Piggins, leader of Winslow's unit for third- and fourth graders. You pool ideas and pick each other's brains. You just don't do this in a self-contained classroom. ...At Wilson school in Janesville, Wisconsin, the upper-grade children have individual conferences with teachers at least twice a week so that unit staffs can keep track of each child's progress in each subject." In both cases the child's individuality is respected, perhaps even to a greater degree than in the traditional classroom.

A case study showing the process of diagnosis and prescription appears in Appendix G.

1.7 Diagnostic Testing Procedures

1.7.1 New Students

Placement of new students in the Fort Lincoln education system will be made on the basis of standardized test scores administered in the school from which he has come and performance of the criterion objectives established as prerequisite for success in a particular stage in the Fort Lincoln School. Entry criteria for exceptional students are discussed in Section 1.10.4 under Special Education and Pupil Personnel Services.

1.7.2 Registered Students

Long-term prescriptions will be made on the basis of student performance and characteristics as measured by pretests and posttests, comprehensive diagnostic achievement tests, and projective tests.

1.7.3 Pretests and Posttests

Some of the instructional materials recommended for use in the Fort Lincoln School include pretests and posttests. Some materials include only posttests; other materials include neither. If the Fort Lincoln staff decides that all materials should have both pretests and posttests, several alternatives are possible:

- Where posttests exist, prepare an alternate form to use as a pretest;
- Where neither test exists, adapt items from standardized tests; or
- Write pretests and posttests directly based on the instructional materials.

The Fort Lincoln staff may also chose between two types of pretests. They may chose to prepare either a pretest that tests the student's mastery of prerequisite knowledge and skills or a pretest that tests the student's mastery of the knowledge and skills covered in the materials.

When pretests are available which test the student's mastery of material in an assigned unit, the student may choose one of several alternatives. The student can decide that he does not want to take the pretest after examining the test. He would then begin work on the instructional activities related to the unit. Or, the student can take the pretest to see how much he knows or does not know. If the student demonstrates proficiency on the pretest, he does not have to do any assignments in the unit. If he does not show proficiency, he will work in those areas in which he is deficient and then take a posttest after completion of the assignments (these can be assignments made by the student himself). With mastery of the posttest the student proceeds to other objectives.

"Proficiency" on objectives or units will include a provision for student choice among scores instead of a single score. For each unit there will be a high and low option score for proficiency. The low option will be a score just better than chance. The high option will allow for only a small error rate — such as 85 percent correct. The student may decide whether he wants to work on the unit until he has a record of consistent correct performance or whether he will accept a higher error rate and go on to the next unit.

In some cases the teacher may require a certain option for the student on the basis of knowledge about the student. For example, if the student has consistently had difficulty with decimals, the teacher might require the student to master the high option proficiency level for multiplication of decimal numbers. Or, if the student has a record of always selecting either the high or low option, the teacher may require the other option to let the student see the benefits of each type of option. If the student does select the low option, he will be required to repeat the test one month later and will be expected to achieve a higher score. The teacher will determine what degree of improvement is necessary depending upon the characteristics of a particular student. If there is no improvement, the student may be assigned work on the objective.

Not all objectives are of equal importance or difficulty. Thus, the high and low options for proficiency will have to be specified for each objective according to the type of activity required as a test of proficiency. In some cases the options may be adjusted for individuals.

1.7.4 Diagnostic Achievement Tests

Test taking will be a more frequent occurrence in Fort Lincoln than in traditional schools. Besides the projective tests, physical examinations, and regularly occurring pretests and posttests, the student will take comprehensive diagnostic achievement tests. The rationale for such tests is detailed in Dr. Lipson's paper, "Comprehensive Diagnostic Criterion-Referenced Achievement Testing." A brief summary is provided here to indicate the use of such tests in Fort Lincoln. (See Appendix H for full text.)

The comprehensive diagnostic achievement tests are to be used for diagnostic purposes, not to produce threatening situations to the student. In no way will the students be penalized for these test results. Rather, students will take the tests as a way of providing a map of what they know and do not know. All items will be referenced to specific Fort Lincoln education system objectives in order to acknowledge and give students credit for what they know. This could eliminate the necessity of taking a pretest if the student has demonstrated knowledge of an objective on the comprehensive tests. Students would be provided with information on where they fit on the map of information. Tests may alert students to areas of interest which they may want to pursue. Tests would also provide projective data (see Section 1.7.5).

The California Testing Bureau of McGraw-Hill Company has recently published comprehensive achievement tests for arithmetic, reading, language arts, and vocabulary. Other tests could be devised by selecting items from existing tests and editing them to fit Fort Lincoln objectives.

1.7.5 Projective Tests

Several measures, used to make inferences from students' behavior, will be made during the student's regular testing time and will consist of three basic types of data. First, responses on the comprehensive achievement tests can be used to monitor student interests and development, such as areas in which the student does very well, but has not studied formally in Fort Lincoln. Second, aptitude tests can be used to map student interests. Third, teacher observations (by use of a checklist, observation schedule, or videotape) can be used to map student's behavior characteristics and development. All such information would be incorporated into the student profile to provide a total picture of the student. This does not necessarily mean that there will be immediate action as a result of the tests. The action depends upon student performance and diagnosis of student needs.

1.7.6 I. Q. Tests

No group-administered I. Q. tests are recommended for Fort Lincoln, since such group measures are not accurate predictors. More important, the plan is to use tests to diagnose student needs, not to compare students on a normative basis.

1.7.7 Test Scoring

Diagnostic comprehensive achievement tests and unit pretests and posttests are to be self-scored by the student. There are several reasons for this. Teacher time can be more profitably spent in other activities. Students learn by observing their mistakes, their correct responses, and their uncertain responses that turned out to be correct guesses. The IPI experience indicates that students do not consider diagnostic tests threatening. Thus, the occurrence of cheating is low because there is no permanent reward for it.

Most tests will be paper-and-pencil tests, particularly in Stage III and Stage IV. But there will also be other kinds of tests, including the recording of student responses on audiotape and the construction or arrangement of objects in response to questions or directions. Some of these tests can be student-scored, but some may be adult-scored, particularly in Stage I and Stage II since younger students could not be expected to consistently match the correctness of a response to a scoring key. This means a greater amount of time of adult or student helpers will have to be apportioned to this activity in the first two stages. Also, for those objectives where physical constructions or arrangements are the test response, space will have to be allotted in the event that such test records must remain several hours before an adult has time to score and interpret the results of such tests.

1.7.8 Test Frequency

While a number of different types of tests have been discussed, testing will not occupy a disproportionate amount of time in the Fort Lincoln Schools. Generally, the tests are about the length of a unit test or a quiz in a traditional school. The difference is in the fact that test items are keyed to specific objectives, and that students and teachers can exercise options on proficiency levels and frequency of test taking. Testing can be an activity the student selects "for fun" as a means of instruction. (See the Guide to Implementation for details on types of testing, frequency of testing, models for developing tests, and lists of existing tests appropriate for Fort Lincoln objectives).

1.7.9 Comprehensive Testing for System Evaluation

It is highly probable that some form of school-wide testing on a standardized achievement test pattern may be conducted to determine the progress of Fort Lincoln students in relation to student progress in other schools. If, when, and how often such tests take place and the specific instrument to be used will be determined by those responsible for system evaluation.

Standardized achievement tests can be used to compare the general achievement of Fort Lincoln School students to students in other schools. However, such tests by themselves are not an adequate base upon which to evaluate the success of the Fort Lincoln Schools. For this purpose evaluation and test instruments should be keyed to the design criteria and the specific curriculum objective of Fort Lincoln. (See also 1.2.6)

1.8 Criteria for Assignment to Stages

So far we have discussed the selection and use of terminal and intermediate objectives (1) to determine academic requirements for all students, (2) to provide for individual student options, and (3) to select materials and activities. Another use of objectives within the school is to determine the assignment of a student to a particular stage.

A stage, as stated previously, is an area to which the student is assigned primarily on the basis of age/development expectancy. Another dimension that guides placement is mastery of certain required and optional objectives. The list of objectives required for assignment to a stage is purposely small since it consists only of the minimal competencies for all children necessary for success at that stage. Most children will exceed these requirements. However, only minimal requirements are specified in order to avoid penalizing a child for inability to comply with behaviors not essential for future success in the school.

1.8.1 Developmental Criteria

Developmental criteria identified as minimal for successful learning in various stages are classified in terms of cooperation, psychomotor skills, management of environment, persistence, memory (attention span), concept development, writing, speaking, reading, observation, and mathematics.

Specific behaviors within each category are those the child will acquire through maturation and/or learn as a result of the experience he has in a particular stage. These behaviors are listed by category for each stage. A behavior is not specified in every category in every stage. In most cases a behavior is omitted because either the average child is physically not ready to perform it or behavior specified for the previous stage is sufficient.

Characteristic	STAGE			
	I	II	III	IV
Cooperation	Works together with another child of his choice for 15 minutes, sharing materials and/or equipment.	Works in group with 3-4 other children, not selected by the child, for 1/2 hour, sharing materials and/or equipment.	Participates in a class of up to 60 students for 1 hour ● Listens to group instruction. ● Does not distract other participants. ● Keeps silent if requested to. ● Takes part in tasks assigned to group.	Participates in a discussion as a member of an assigned group, contributing information but not dominating the group, tolerating differences of opinion, and building on the ideas of others.
Psychomotor Skills	Responds to a task or question by making a mark on a paper, selecting a simple object or matching 2 simple objects.	Puts on winter coat, boots, and mittens in 10 minutes. Deals a standard deck of cards. Unlocks a door with simple lock and key. Cuts finger nails or manipulates simple tools such as scissors without injuring himself. Ties shoes.	Collates up to 20 pages in proper sequence. Follows three-part direction code to open a combination lock.	None

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Characteristic	STAGE I	II	III	IV
Management of Environment	Finds his way around instructional areas to locate familiar materials Uses, keeps track of, and puts away when finished playing with them, 4 large objects likely to be scattered in course of play.	Goes to school alone in daylight hours. Reads stop signs, signal lights, etc. Operates a Language Master, filmstrip projector, record player, single concept film projector and cassette tape recorder. Uses, keeps track of, and puts away materials for required and optional objectives 70 percent of the time. Asks for help when source of information is not adequate.	Reads a simple map of the neighborhood to get to a specific location. Operates a 16mm projector; records on a tape recorder. Uses, keeps track of, and puts away materials for required and optional objectives 80 percent of the time. Uses reference skills to find information; for example, he uses the card catalogue to locate a book on a given subject. Follows school rules at least 75 percent of the time.	Uses various sources of information and tools to check validity of data.

	STAGE			
Characteristic	I	II	III	IV
Persistence	Given a simple task, persists in that task for at least 15 minutes.	Given a simple task, persists in that task for at least 1/2 hour. Given responsibility for a simple task, carries it to completion (e.g., reads a story to a younger child).	Follows directions on a standardized achievement test. Given a task with partial directions and some procedures for student to decide upon, manages and/or persists in task for 20 minutes. Turns in completed work assigned the previous day.	Given task, decides upon procedures to be used to complete task and manages and/or persists in task for 1/2 hour. Given an assignment to be completed 6 days later, completes the assignment within allotted time.
Memory (Attention Span)	Given a three digit span (letters, names, numbers) at random, repeats the 3 digits immediately after all 3 are stated. Given a simple declarative sentence which states an act to be performed, repeats the instruction.	Given a simple declarative statement requiring an act the student can perform, follows the directions. Time between statement of direction and opportunity to perform should not exceed 3 minutes. Dials home phone number from memory. States address Identifies basic colors.	None	Given four related, dependent, sequential, and meaningful operations extending over at least 10 minutes when both the language and operations are known to be in the student's repertoire, student completes the task; student may write down directions if he chooses.

	STAGE			
Characteristic	I	II	III	IV
Memory (Attention Span) (cont'd)				Listens to and relays a meaningful message when the content and language used in the message are known to be within the student's repertoire. Time delay between direction and execution should not exceed 5 minutes.
Concept Development	Has mastery of 500 concepts as indicated by ability to use associated vocabulary words such as cat, apple, or water orally.	Has mastery of 1,000 concepts as indicated by ability to use associated vocabulary words orally.	Reflected in terminal objectives.	Reflected in terminal objectives.
Writing	None	Writes, prints, or types name without error. Writes letters when dictated for words of up to 6 letters (no spelling involved).	None	Completes required terminal objectives for writing.
Speaking	None	Speaks in a sentence when requested to do so in response to questions such as "Tell me about the picture" (descriptive sentences only)	Speaks in a sentence when requested to do so in response to questions seeking descriptions and/or logical connections such as cause and effect.	Completes required terminal objectives for speaking.

	STAGE			
Characteristic	I	II	III	IV
Reading	None	Decodes 500 words at 90 percent proficiency including basic connective words from Dolch list plus any phonetically regular words.	Answers questions regarding factual information given in a one-paragraph reading selection the student can decode.	Completes required terminal objectives for reading.
Observation	None	None	Draws a scene or makes a diagram which is recognizable at a later date to the student and to others as a method of recording an observation.	None
Mathematics	None	Uses numbers to 100 in identifying addresses. On request, can count or collect any number of objects up to 12.	Reads a 12-hour clock.	Completes required terminal objectives.

1.8.2 Academic Criteria

Besides proficiency on developmental objectives, as specified above, academic performance is considered in the assignment of students to stages. There will be latitude in the time, rate, and order with which students achieve academic objectives as long as the student demonstrates proficiency on required terminal objectives for graduation from Fort Lincoln School. However, the student will be required to complete a specified number of required intermediate objectives in each stage of the school. The number in each area is small because the emphasis is on the minimum expected for all students.* Most students will complete many more objectives.

In Section 1.4, it was stated that some objectives would be optional depending upon student, parent, and teacher concerns. To ensure that all students have some experience in every curriculum area, they will be required to select a minimum number of objectives in each area. For objectives selected by the student, it will be acceptable for him to leave some incomplete or to partially complete others without achieving proficiency. However, in order to build persistence and to learn to take responsibility for actions, students in each stage (except Stage I) will be required.to complete certain percentages of the optional objectives they select. A summary of academic criteria for stage placement appears on the next page.

The number and difficulty of the behavioral development objectives and academic objectives required for stage placement are such that a number of children will meet these requirements well in advance of the general level for a

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* These estimates are made upon the number of units (comparable in size to intermediate objectives in Fort Lincoln terminology) mastered on the average in IPI.

Summary of Academic Criteria

Subject	I	II	III	IV
Mathematics	See Developmental Criteria	10	20	Completion of Required Terminal Objectives
Reading		10	15	
Communication Skills		4	6	
Health		2	4	
Arts and Humanities		4	6	8
Social Studies		6	8	12
Science		10	15	20
Physical Ed.		4	6	6
Percentage of optional objectives that must be completed		30%	40%	60%

particular stage. Conversely, some students with particular disabilities (such as special education students) will be much older than the general age expected for a stage. In cases where there is a large deviation from the ages expected, the decision for assignment to the next stage should take place in consultation with the parent and student. Options in such cases will include having the student remain at his present stage but using some of the materials from the next stage; having similar materials available in adjacent stages; or having the student divide his time between two stages.

In summary, the criteria for stage assignment within Fort Lincoln consist of:

- Proficiency on required developmental objectives.
- Completion of a minimum number of required academic objectives in each curriculum area.
- Completion of a certain percentage of selected optional objectives.
- General teacher, parent, and student review in cases where readiness for assignment to another stage varies significantly from the age expectancy for that stage.

Summary forms of requirements to be met by students for progression from one stage to another are contained in Appendix I (see figures E1-E4). Data to complete the summary sheets will be summarized from prescription sheets (for academic requirements) and observational records (for developmental behaviors) as requirements are met, and dated accordingly. Information gathered from observational records will be included after three consecutive monthly observations in a nontest situation have confirmed that the student can perform the desired behaviors. When the student has met minimal requirements for assignment to the next stage, regardless of the time during the school year, he can move on unless there are special reasons to review the situation with the parents and the student.

The numbers of objectives to be completed and selected that appear in this section, and on the summary sheets in Appendix I, should not be considered fixed standards. They are estimates based on student performance with individualized instruction in other schools. Teachers in the Fort Lincoln School will evaluate and revise the standards based on the performance of Fort Lincoln students after the school is in operation.

1.9 Parents' Role in the Instructional Program

Parents of children in the Fort Lincoln School may play a number of roles. As members of the community they may take part in adult education courses or use recreation facilities; they may be resource persons, providing special skills, materials, or manpower; they will be decision makers indirectly through representatives on school councils and directly as parents of individual children.

The following procedures relate to decisions parents make about their children. (Procedures related to roles of other community residents as resource and representative decision makers are discussed in the Community Participation Plan, Volume II, Section 4.)

The philosophy of the school toward parents, the ways the philosophy is implemented, and the degree to which programs are explained to parents and prove reliable all enhance the value of the parents' contribution to the child and to the school.

The total program for effective parental participation can be discussed in terms of: orientation, parents' handbook, and parental involvement.

1.9.1 Orientation

Orientation, the introduction and explanation of the program and facilities of the Fort Lincoln School, begins when the children who will attend the school are identified. A parent orientation program will be planned and implemented by a committee of school and community representatives. Possible activities include participation in staff training program events to meet staff members, touring the school, or observing of children working with curriculum materials that will be used in the school. Parents might also attend small-group meetings to identify particular interests, skills, and resources that parents would be willing to contribute to the instructional program.

1.9.2 Parents' Handbook

The parents' handbook can include such information as a description of the education program, a calendar of school events, a schedule of school hours, names and telephone numbers of persons to contact for various reasons, and a roster of school staff with titles and locations. The school-community committee responsible for preparing, producing, and distributing this handbook may identify other useful information. The handbook committee may be the same as the parent orientation committee, a subcommittee, or a separate committee. A suggested outline for the parents' handbook is contained in Appendix C.

1.9.3 Parental Involvement

The philosophy of the Fort Lincoln education system is that the parents and the teachers are partners in the education of the child. The teacher relies on the parents for information and cooperation to plan a suitable instructional program. The parents rely on the teacher for professional judgment and specialized training in providing the most effective learning environment possible for the child.

To support this philosophy, policies such as these should be adopted and conveyed to parents:

Visiting

- The school is open to parents to visit whenever they wish.
- Parents visiting the school are requested to notify the office manager in the reception area of their presence in the school.

- Parents are encouraged to observe unobtrusively in any area or areas of the school they wish.
- Questions about general school activities may be directed to anyone in the school but preferably to staff members not directly engaged in instructional activities.
- Closed circuit TV monitors placed in special observation areas may supplement instructional area visits to some degree.

Conferences

- The first formal teacher-parent conferences should be delayed until the teachers have had time to perform diagnostic tests and learn to know the children somewhat, probably six to eight weeks after school opens. Formal conferences should be arranged in advance.
- Brief, informal conferences may occur at any time and as the need arises. This policy should continue unless the demand on teacher time interferes with instructional activities.
- Parents will confer with the teacher who is responsible for making long-term diagnoses and prescriptions for their child.
- Formal parent-teacher conferences should be held as frequently as necessary for the satisfaction of all concerned - parent, child, and teacher. A minimum of two conferences per year is recommended.

- Formal conferences will be held for the purposes of reviewing the child's progress, planning future activities, and seeking to prevent or to remedy problems.

Reports to Parents

- Parent-teacher conferences are recommended as most fruitful for informing parents of their children's progress.
- A model report form to parents is contained in Appendix D. This model can be used in a number of ways. During Phase I teachers may wish to make revisions in this model, perhaps in conjunction with parent representatives. Another possibility is to use the model for a trial period and then revise it.
- Parents have access to all the instructional records of their child including diagnostic test results on request.
- Other methods of reporting to parents which may supplement both conferences and written reports include actual demonstration by the child of his ability to perform, videotapes of the child's activities, and things the child has produced - paintings, stories, constructions, models, tape recordings.

Items for Parental Decision

- Arrival time and days in school — School will be open for regular instruction 7 a.m. - 7 p.m. six days a week and parents will complete a form specifying the preferred arrival time and the five days the child will attend.

- Vacation time — Vacation time of two months may be taken anytime during the year. The exact time should be arranged two months in advance to allow the school to plan staff time and vacations.
- Optional school attendance — Parents and school staff both need to know of the student's presence in the school at times other than scheduled attendance and agree who is responsible for him at those times.
- Instructional program — Parents may make modifications by requesting that the child spend additional time on some objectives, select more objectives in a particular subject, or demonstrate a proficiency level on an objective which is higher than the minimum level set by the school. Parents may or may not wish to exercise these options which may be made at a parent-teacher conference or by written request.
- Homework — Students will take work home at their own discretion, but parents may wish to request that teachers give assignments in specific areas if they feel the child needs more review. They may also request guidance in ways that they (the parents) can help the child at home.

The policies should be explained at a general meeting and summarized in the Parent's Handbook so that parents as well as teachers have a clear understanding of what they may expect from each other.

1.10 Special Education and Pupil Personnel Services

1.10.1 Rationale

Provisions for exceptional children in the Fort Lincoln School were based on the following considerations:

- Individual differences among students will enrich rather than hinder the educational experience of all children in the school.
- For educational purposes, exceptional children should be viewed as as having severe and/or unusual learning problems during a given activity, rather than as mentally retarded, perceptually handicapped, emotionally distrubed, etc. Depending on the learning activity,different students will display different learning styles which will facilitate or impede progress.
- The learning patterns of exceptional children differ from those of normal children in degree rather than in kind. Normal children are defined as those children having no special, diagnosed difficulty with usual methods and materials in a given situation.
- The chief advantage of special groups for exceptional children when needs are demonstrated is the opportunity for individualized instruction by a specially trained teacher; this opportunity will be offered to all students in the Fort Lincoln School.
- Research on the efficacy of special class placement for most exceptional children indicates that it produces negative effects on self-concept, social skills development, expectations of teachers and parents, and achievement, more often than it produces positive effects.

- Teachers with training in special education can contribute significantly to the instruction of "normal" students.
- Traditionally special classes treat exceptional students as exceptional in all instances. Individualized instruction will provide special help where needed and will not hinder progress in areas where the student displays no unusual learning patterns.
- A set of minimum entry behaviors should be required for all children in the Fort Lincoln School, since the learning environment makes some unalterable demands on them, and the education program presupposes that certain behaviors are in every student's repertoire.

The current thinking about the concept of pupil personnel services emphasizes the provision of services (social and psychological) which create a climate of optimum mental health of both students and teachers. Provisions for pupil personnel services were based on the following considerations:

- The primary goal of pupil personnel services is facilitation of the learning process, which requires as much work with staff as with students.
- The effectiveness of pupil personnel workers can be increased if they can observe and interact with students and staff in the classroom environment over an extended period of time.
- Personnel qualities and demonstrated talent for human relations work are as important as educational qualifications for success in pupil personnel roles.

- In the Fort Lincoln School, teachers with special competence in areas related to pupil personnel services are regular team teachers, with no differentiation in salary levels, reporting procedures, or career advancement from the norms set for all staff.

1.10.2 Placement of Exceptional Children

When students display exceptional learning patterns they will not be placed in special classes, but will be assigned to stages, follow individualized programs, and receive instruction from various teachers, as students whose progress is more typical of the age group.

1.10.3 Resources for Exceptional Children

The human resources available to meet the educational, social, and emotional needs of students will be available to each child in the school as the need arises and will include the following persons:

- A teacher with special education competencies, i.e., education, experience, and skill in restructuring the learning tasks to meet the needs of children with atypical learning styles for their age group.
- A teacher with human relations competencies, i.e., education, experience, and skill in diagnosing intellectual, emotional, and social strengths and weaknesses of children.
- Teachers (regular staff members) with proficiencies in a variety of academic and creative pursuits to guide and instruct gifted students.

- An aide with special competency and interest in working with children who have special learning needs.
- An aide with an outstanding gift for relating to children when emotional and social problems arise.
- A full-time school nurse and part-time school physician.
- An itinerant sight-conservation teacher.
- An itinerant speech therapist and hearing conservation teacher.
- Volunteers and student helpers.

The roles of these personnel are elaborated in the Organization/ Staffing Plan of this report (Volume II, Section 2) and in the "Segment of a Typical Day" which concludes this section. The contributions of these persons to meeting the needs of children is, therefore, only briefly described here.

- Teacher with special education competencies.
    - Diagnoses strengths and weaknesses in perceptual, cognitive, and motor skills.
    - Prescribes activities and materials for development of these skills.
    - Supervises aides, volunteers, and student helpers in implementation of prescribed programs.
    - Assists teachers responsible for instruction in various subject areas by helping them prescribe programs for students with atypical learning patterns in those areas.

  - Participates in conferences with parents of children having special learning needs.
  - Trains teachers, aides, and volunteers in theory and methods of special education, including applications to a wide variety of learning styles.
  - Maintains liaison with community resources which can provide additional services for students in the Fort Lincoln School.
- Aide for children with special learning needs.
  - Assists with implementation of prescriptions which require skills for the treatment of special learning needs.
  - Assists in diagnosis of learning abilities and disabilities of students.
- Teacher with human relations competencies.
  - Diagnoses emotional and social needs and intellectual abilities of students.
  - Communicates implications of test results for students' educational programs to teachers, parents, and students.
  - Designs behavioral management programs for selected students with behavior adjustment problems.
  - Counsels students and their parents on their shared social-emotional needs.

  - Trains teachers, aides, and volunteers to understand and respond constructively to social-emotional needs of students, and to design and implement behavior management programs when needed.
  - Maintains liaison with community resources which can provide services for social-emotional needs of Fort Lincoln students.
- Human relations aide.
  - Counsels students in crisis situations.
  - Counsels students and teachers in order to prevent the recurrence of school-based crises.
  - Assists with implementation of behavioral management programs.
- Nurse and part-time physician.
  - Observe students suspected of needing medical services.
  - Recommend medical services to parents.
  - Liaison with family physicians, neurologists, and others who serve Fort Lincoln students.
  - Develop a health education program in conjunction with teachers and community organizations.
- Itinerant sight-conservation teacher.
  - Provides diagnoses, prescriptions, and instruction to visually impaired students.
  - Supervises and trains teachers, aides, and volunteers in implementation of prescribed programs.

- Speech therapist-correctionist (part time).
    - Provides speech therapy to students with speech disorders (e.g. lisp, stutter).
    - Assists teachers in planning language development programs for students with language deficiencies in order to build from but not destroy their social dialects.
- Volunteers and student helpers.
    - Assist with implementation of prescribed programs, under supervision of professional staff member.

The equipment, materials, and resources of the school will include many items of particular use to students with special learning needs in a given skill area. These include:

- Equipment — large-type typewriters, tape recorders, cassette tape players, projectors, controlled readers, tachistoscope, audio flash card and language master machines, study carrels, adjustable furniture.
- Materials — Perceptual, cognitive, and motor training materials - both pencil and paper and manipulative, academic skills materials for students with perceptual, cognitive, or motor disabilities, academic games, films, slide-tapes, audio tapes.
- Resources — In addition to a wide variety of equipment and materials are metropolitan resources, independent study programs, creative teaching practices (see Idea Book, Creative Education Foundation), and the freedom to explore which will make Fort Lincoln ideal for unusually gifted children.

All human, equipment, and materials resources of the school will be available for the instruction of all students. It is assumed that the teacher with special education competencies will work extensively, but not exclusively, with students who have been diagnosed as exceptional in a given area of learning. It is also assumed that materials for perceptual, cognitive, and motor training will be used extensively but not exclusively by these students. This assumption follows from the idea that learning problems of children differ in degree and not in kind. Therefore, many children experience transitory but severe learning problems which can be remedied with special educational staff, equipment, and techniques.

1.10.4 Minimum Entry Requirements

Minimum criteria for entry into the school have been established in order to accommodate students with as wide a range of individual differences as possible, and exclude students who cannot profit from the educational experiences offered or whose participation in the school poses a significant danger to others or themselves. These criteria are:

- Toilet trained
- Self feeding
- Visibly responsive to environment

  All children in the school should have some capacity to learn, however small, and this requires a modicum of responsiveness to the environment. This criterion excludes the profoundly retarded and acutely psychotic.

- Capacity for controlled responding

  If he can't speak or write, the handicapped child should be able to tap, nod, blink, or do something in response to specific stimuli.

- Predictability in destructive-aggressive behavior

  Destructive and aggressive children are manageable if there are warnings before outbursts, but if they occur without visible cause, other children and the teacher will live in fear of the disturbed child, which affects everyone negatively.

- Not legally or medically judged to be psychotic

- Comprehends verbal communication either through hearing, or lip-reading

- Communicates physical needs, emotional reactions, intellectual accomplishments

  If speech is unintelligible, handicapped children should have well developed gestural communication.

- Recognizes letters in large type books or has braille-reading skills

- Activity level which is not disruptive to other children

  Most children can adjust to a "wall-climber" fairly easily, and so can teachers, _if_ he is not destructive, noisy, or too bizarre.

- Orientated in space; can navigate in a classroom and out of doors

- Mobility — either on foot or in a wheel chair

1.10.5 Resources for Children and Projected Numbers By Physical Disability and Special Learning Needs

"Labelling" of students according to category of exceptionality will be eliminated at Fort Lincoln. The nature of a student's strengths and weaknesses is dependent upon the structure of the specific learning task. Projected numbers and availability of resources for students with atypical learning needs are included here to give planners data with which to organize for the opening of school. The purpose of the chart is to provide a quick and rough overview of available resources and of the flow of assistance at each stage of the helping process.

Resources for Exceptional Students in the Fort Lincoln School

Category & Projected No. of Students*	Referral & Screening	Diagnosis	Prescription
Special Learning-Needs (28-46 students per subject area)	Special Education Teacher Human Relations Teacher D. C. Health Dept. vision & hearing screening	Special Education Teacher → Diagnostic tests, materials & equipment	←
Speech Disability (8-14 students)	Special Education Teacher Speech Therapist D. C. Health Dept. vision & hearing screening	Speech Therapist	Speech Therapist & Special Education & Language Arts Teachers
Physical Disability (except vision and audition) (1-4 students)	Nurse School Physician D. C. Health Dept. vision & hearing screening		School Physician
Visual Disability (1-4 students)	D. C. Health Dept. vision & hearing screening School Physician Special Education Teacher School Nurse		Sight Conservation Teacher, with Special Education Teacher
Auditory Disability (1-4 students)	D. C. Health Dept. vision & hearing screening School Physician School Nurse Speech Therapist	D. C. Dept. of Speech & Hearing	Hearing Conservation Teacher, with Special Education Teacher

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* Figures based on USOE national percentage estimates.

Instruction	Student Counseling	Parent Counseling	Community Liaison
→ Teaching staff, including Special Education Teacher & Aide Student helpers Special education materials & equipment A-V materials & equipment	→ Human Relations Teacher and Aide	→ →	→ Human Relations Aide Learning Reinforcement Aides
Teaching staff Special education materials & equipment A-V materials & equipment	Human Relations Teacher Human Relations Aide	→	→
Teaching staff A-V materials & equipment	School Physician Human Relations Teacher Special Education Teacher Human Relations Aide	→ → →	→ → → Learning Reinforcement Aides
Teaching staff A-V materials & equipment	Human Relations Teacher Special Education Teacher Human Relations Aide	→ →	→ → Learning Reinforcement Aides
Teaching staff →	→ Human Relations Teacher Human Relations Aide	→ →	→ →

1.10.6 Pupil Personnel Services

Pupil personnel workers at Fort Lincoln will be called upon to assume functions which may or may not be similar to those currently performed by pupil personnel workers in the D. C. schools. These functions are to:

- Evaluate students with behavior problems.
- Consult with teachers on behavior management.
- Evaluate students believed to have special learning needs.
- Counsel students individually and in groups.
- Consult with parents and teachers individually and in groups.
- Train staff in human relations and psychology of learning, with emphasis on their application to educational planning.
- Provide close liaison with community resources for children with social and emotional needs.
- Develop school and community based resources to meet the needs of parents, teachers, or students.

1.10.7 Resources for Pupil Personnel Work

The human resources for pupil personnel work include one teacher with a human relations specialty, i.e., education, experience, and skills in diagnosing and treating intellectual, emotional, and social needs of children, and one aide with an outstanding gift for relating to children with social and emotional problems.

The services offered by these persons were described briefly in Section 1.10.6 and will be outlined more fully in the role descriptions for these positions which are part of the Organization/Staffing Plan (Volume II, Section 2) of the report and the "Segment of a Typical Day" series which concludes this section.

It is assumed that the human relations specialist will serve all students in the school directly or indirectly through such means as short-term counseling services which will be available to all students on request, and on-going consultation and training of all school staff in human relations.

An additional pupil personnel services resource will be the aides who participate in the Learning Reinforcement Program, which is described in the Community Participation Plan, Volume II, Section 4. Although it will not be their primary function, these aides will be available to make home visits and to mobilize community concern and assistance for students with acute problems which may originate at home, in the community, or in school.

The extent to which the Fort Lincoln School is able to deal effectively with the emotional and social needs of students, staff, and parents depends, to a large extent, on the availability and responsiveness of resources in the community. The flexible organization and richness of human resources in the school will make possible the provision of healthy emotional environments for students and staff. In cases where a restructuring of the student's relationships and activities at home and in the neighborhood will be crucial to his social and emotional growth, the pupil personnel service can be called upon.

Equipment, facilities, and materials resources for pupil personnel work include flexible walls and furnishings so that a diagnostic play room can be set up; quiet, comfortable areas for "cooling off" and talking; a large supply of educational and psychological diagnostic tests and instructional programs;

and an extensive library of materials on human growth and development, personal adjustment, and human relations in the family, school, community, government, and other cultures. These aids will be available to all school personnel.

1.10.8 Segments of a Typical Day

Teacher with Special Education Specialty

Selects math materials for Tim, who has visual perception weaknesses when using the usual worksheets because they have too much material on a page.

Instructs a volunteer on Tim's visual needs and his current achievement level in math, so she can make some additional worksheets for him.

Administers the Illinois Test of Psycholinguistic Abilities to Charlene who is an advanced student in every area except spelling in which she does terrible work because she spells phonetically. Results suggest weakness in visual memory. Administers other tests of visual memory and confirms diagnosis. Prescribes exercises; explains exercises to Charlene and her language arts teacher.

Interviews a student who has completed all arts and humanities objectives he wishes to select. Decides with student upon a fine arts program which will take him to metropolitan area facilities two days a week. Student will be tutored by local college student on Saturdays.

Shows exercises to strengthen fine motor coordination to a group of students having trouble manipulating pencils.

Selects materials to build verbal listening skills for Mark, who is highly distractible, and whose comprehension of spoken language is very weak.

Demonstrates exercises in the Frostig Developmental Perception programs for aide, volunteers, and parents.

Meets with a group of parents interested in learning how to strengthen the oral language skills of their children. Introduces them to materials available at the school, refers them to resource books, and suggests specific exercises, games, and other materials for use at home.

Shows a volunteer how to cut and paste from a Sears Catalog to make language arts materials for Sally whose attention span for verbal materials is about 30 seconds, and who should have worksheets which she can complete within that time in order to feel successful.

Interviews Molly who has completed all the objectives in mathematics and is unsure about what to do next. When Molly suggests an interest in geometry, teacher refers Molly to a math specialist for a new prescription. Arranges for Molly to tutor a small mathematics group in Stage II.

Segment of a Typical Day

Special Education Aide

Conducts a language drill for a group of students with poor verbal fluency; encourages them to talk by having them ask and answer questions, repeat rhymes, repeat sentences, etc.

Plays "game" with Joe and Ron to strengthen their visual memory for familiar objects; shows them a tray of objects, removes tray and asks them to recall as many objects as possible, removes or adds an object, shows the tray again and asks them to identify the object added or removed, etc.

Reports to special education teacher that although both Joe and Ron are improving in their performance on the visual memory games, only Joe enjoys them. Ron feels humiliated and resentful and, therefore, different learning tasks are needed in this area.

Conducts one of a series of observations of Carl, using time-sampling techniques, to determine whether the length of time he pays attention is greater with auditorially or visually presented learning materials.

Supervises use of controlled reader by several students.

1.11 Information Summary

The fold-out pages following this introduction contain a tabular summary of the forms and procedures that have been discussed in previous sections of the education plan. Only Stage I and II are included. The forms and procedures for Stage II apply to Stage III and IV with one exception. A student who has completed the minimum requirements for Stage IV is eligible to be graduated from the Fort Lincoln education system pending decision by the student, his parents, and the school staff upon consideration of other factors such as age, personal goals, and time of year.

Stage I

For each stage, procedures are outlined for a new student entering the stage and for a registered student. Assume that a new three-year old is being registered at the Fort Lincoln School. Start in the upper left hand corner of the first fold-out page headed "Education Program - Information Summary." In the first column, headed "Stage I," the category "New Student" and the entry requirements are listed. Reading across the top of the page column-by-column one can determine what information is required, how it is obtained, who supplies it or obtains it, the form on which it is recorded, where it is filed, how often it is reviewed, and any related procedures.

In the column headed "Form," the name of the form is followed by a reference to a figure. Each figure is a facsimile or a sample form and is contained in Appendix I.

On the second page of the Stage I Information Summary the term "Advisor" appears in the column headed "from or by whom." This term designates the teacher who is responsible for making long-term prescriptions, conferring with parents, and guiding and planning with the student. Every professional in the school, including the school level staff, will be assigned a certain number of students for whom he will serve in this role. Advisor/student assignments are subject to the mutual agreement of student, parents, and teacher.

The transition phase at the bottom of the second page describes the transfer of records and folders when the student is assigned to Stage II.

Stage II

The same format is used for the Stage II Information Summary. In this stage a new type of folder is added and some additional forms are used.

A folder is prepared for each student in each subject area (each student could be responsible for setting this up himself with guidance from a student already in Stage II). On the forms kept in this folder are recorded the short-term prescriptions, activities, and test results related to that subject. Before short-term prescription sheets are discarded, summary information is transferred to cumulative forms in the subject area folder or the stage folder.

Stage I		What Information	How Obtained	From or by whom	Form	Where Filed	I o
New Student Entry Requirement: Should be toilet trained; three years old	Family Background	Parents' name and address Emergency contact Record of birth Siblings	Form mailed home, or parent-teacher conference	Parent	D. C. Forms See Figures A, B, and C*	Permanent Folder (kept with teacher who does long-term prescriptions in the stage student is assigned to).	Y
	Health Record	Immunization	Mail or Interview	Parent	Figure C	Permanent Folder	
		Physical Exam. Screening -- Dental Eye Ear	Examination	School Nurse, Physician	D. C. Forms Figure D (not yet available)	Permanent Folder	Y
Registered Student	Developmental Profile	Creativity Reasoning and Problem Solving Perception Work & Study Skills Understanding the World Communication Self Confidence Reading, Writing, Arithmetic Readiness Beginning Subject Areas -- Science, Social Studies, Art, Music	Observation	Teacher	Checklist adapted from discovery objectives, 35 basic learning skills, 1 checklist per skill. See Figure J for sample checklist.	Stage I Folder	E we 10 chi
		Vocabulary Development	Observation	Teacher, Aide, Student helper	See Figure K for checklist	Stage I Folder	Da

* All figures are contained in Appendix I [illegible] 1-80

ogram - Information Summary

lled	Frequency of Review	Related Procedure
older acher g-term s in the t is .	Yearly -- to keep information up-to-date	Can be reviewed during regular parent-teacher conference.
Folder	Yearly	
Folder	Yearly	
er	Every three weeks, 10 minutes/ child .	1. Every three weeks, teacher observes child in a different activity for 10 minutes. 2. As behaviors are observed they are noted on the appropriate checklist and added to the child's Stage Folder. 3. When all minimum skills on a checklist have been achieved, that skill area is crossed off on a Summary Sheet in the Permanent Folder. 4. Active checklists sent to next stage.
ler	Daily	1. A vocabulary list of words classified according to major headings and arranged alphabetically has been developed including space for additional words. 2. As the words appear in the student's speech, they will be noted on some interim record system developed by the stage staff. 3. Periodically these words are checked on the Master List, if listed, or added. 4. Mastery of 500 words representing concepts is one requirement for progress to Stage II. 5. When 500 words have been recorded on vocabulary checklist, this is noted on Placement Summary Sheet. 6. Recording of words continues, and vocabulary checklist is sent to Stage II when the student progresses.

(Stage I continued on next page.)

Stage I - cont.	What Information	How Obtained	From or by whom	Form	Where Filed
	Long-Term Prescription	Review of Checklists	Advisor	Long-Term Prescription See Figure G	Permanent Folder
	Summaries Placement (Stage I Terminal Objectives) Basic Learning Skills	Review of Checklists	Advisor	Placement Summary Sheet Figure E1 Basic Learning Skills Summary Sheet Figure F	Permanent Folder
Transition	Profile data which is sent to Stage II Family Background Health Record (D) Placement Summary Sheet (E1) Basic Learning Skills Summary Sheet (F)	(A, B, C)			Permanent Folder which goes with student to Stage II advisor.
	Basic Learning Skills Checklists(J) Active Vocabulary Checklist (K)				Put in Stage II Folde

Filed	Frequency of Review	Related Procedure
Folder	Every three months	1. Based on development pattern demonstrated by checklists which teacher reviews 2. First prescription should not be made until child has been in school at least six to eight weeks. 3. Prescription will be made only if checklists show gaps or problems. 4. Teacher uses prescription to direct aides and student helpers to perform instructional activities.
Folder	Every three months	1. Mastery of behavior required for progress to Stage II is noted as it occurs. 2. When all behaviors have been mastered, student is considered for transfer (see Criteria for Assignment to Stages, Section 1.8, for further discussion).
Folder with age II		Some students may be pursuing learning activities in both Stage I and Stage II. In such cases, teachers in both stages must establish some procedure for observing, prescribing, and keeping records.
II Folder		Stage I Folder becomes Stage II Folder unless it needs to be replaced due to wear.

Stage II		What Information	How Obtained	From or by whom	Form	Where Fil
New Student		Family Background Health Record (see Stage I)				
		Achievement in terms of Ft. Lincoln objectives (see Criteria for Assignment to Stages, Section 1.8).	Test for mastery of minimum objectives for progress into stage encompassing student's age. Scores on standard tests taken in previous school.	Advisor	Placement Summary Sheet I, II, III, or IV (mastery of IV means student is eligible for graduation). Figures E1, E2, E3, E4	Permanent Folder
Registered Student	Developmental Profile	Diagnostic data for initial long-term prescription	See Stage I transition	Advisor-Parent Conference	Long-term prescription Figure G	Original in permanent folder; duplicate in Stage II folder. Kep by student.
		Pre- and posttest scores on tests keyed to intermediate objectives prerequisite to required terminal objectives. Refer to Guide to Implementation	Student Performance	Test taken by student; scored and recorded by student, aide, teacher	Short term prescription form. Specific one for each unit Figure N-O	Subject area folder: one for each student, kep in corresponding stag area.

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* See Diagnostic and Testing Procedures, Section 1.7, for an explanation of this term.

rogran - Information Summary

Filed	Frequency of Review	Related Procedures
nent	Once new student is placed, review schedule is same as for registered students	
al in nent : ate in II . Kept dent.	3-5 months	Parents included only every other time when reviews are more frequent than every five months. Advisor uses both Permanent Folder and Stage Folder when preparing long-term prescription.
t area : one ch it, kept res- ig stage		1. Student who chooses and achieves a low option proficiency* on a pretest for a unit will record his score on the short-term prescription form for that unit, give it to the teacher in that area to indicate need for retest one month later, and go on to next unit. 2. Student who chooses high option proficiency, or for some other reason completes the unit, records pretest on short-term prescription form. 3. Proficiency options are recorded on test option sheet in stage folder. 4. Completed objectives are recorded on completed objectives summary sheet in stage folder.
	Every three weeks, 10 minutes/ child	

is term.

(Stage II continued on next page.)

1-21 R

Stage II		What Information	How Obtained	From or by whom	Form	Where Filed
Registered Student cont.	Developmental Profile	Behavior and Interest Information	(1) Formal interest inventory (2) Record of selected activities (3) Interview (4) Observation	Teacher Student, Aide Parent-Advisor	BLS checklists from Stage I and others to be chosen and/or developed by teachers See Figure L for sample.	Stage II Folder.
		Comprehensive Diagnostic Achievement Tests*	Frequent, regular testing on standardized test items keyed to objectives and/or teacher made test items.	Test taken by student; scored and recorded by student, aide, teacher.	To be developed by teachers. See Testing Section in Guide	Corresponding subject area folder.
		Short term prescription	Recommendations of long-term prescription. Student performance on pretests and posttests.	Teacher or aide in subject matter area.	Short-term prescription form. Fig. N	Student's subject area folder.
		Placement(Stage II Terminal Objectives)	Long-term prescription review	Advisor	Stage II Placement Summary Sheet. Fig. E2	Permanent Folder.
		Objectives completed to date	Short-term prescription form	Stud. /Aide, Teacher	Completed Obj. Summary Sheet Figure H	Stage II Folder
		Test options selected	Short-term prescription form	Student	Test Option Summary Sheet. Figure I	Stage II Folder.
		Interest and/or activities	Short-term prescription form	Student	Activities Summary Sheet See Figure M	Stage II Folder
		Behavioral and Interest Information	Projective tests, observation	Teacher	See Figure L	Stage II Folder.

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* See Diagnostic and Testing Procedures, Section 1.7, for an explanation of this term.

ed	Frequency of Review	Related Procedures
	3 - 5 months	1. For required objectives student may choose which activities keyed to those objectives he will complete. 2. Student may choose which optional objectives he will try, given the number required. 3. Optional activities and objectives recorded in the student's subject area folder will be summarized in the student's stage folder.
d-	15 minutes/ day	
	Weekly	
	3-5 months	

(Stage II continued on next page.)

Stage II	What Information	How Obtained	From or by whom	Form	Where Fil
Registered Student cont.	Basic Learning Skills	Observation	Teacher	BLS Checklist Sheet Figure J	Stage II folder
	Vocabulary	Observation	Teacher, Aide, Student	Checklist Figure K	
	Current Year's Work	From short-term prescription sheet	Teacher, Aide, Student	Current Year's Work Summary sheet. Figure P	Subject are folder
	Previous Year's Work	From current year's work summary.	Teacher, Aide, Student	Previous Year's Work Summary sheet. Figure Q	Subject area folder
Transition	Profile Data which is sent to Stage III Family Background (A, B, C) Health Record (D) Placement Summary Sheet (E2) Long-Term Prescription (G)				Permanent Folder to Stage III
	Objectives completed to date (H) Test options selected (I) Interest and/or activities (M) Behavior and Interest Information (L)				To Stage III Folder
	Short-term prescription (N) Current Year's Work (P) Previous Year's Work (Q)				

re Filed	Frequency of Review	Related Procedures
II r		Probably by end of first year in Stage II all these checklists will have been completed and other behavioral observation instruments initiated.
		As student learns to read, he can assume more and more responsibility for this record. 1,000 words minimum for progress to Stage III.
t area r	n unit has been completed: every 2-4 weeks.	Before short-term prescription sheet for a completed unit is discarded, test scores and options, types of activities prescribed or selected, and number of days worked are transferred to current year's work summary sheet.
t area r	Yearly	Before current year's summary sheet is discarded, test scores and days worked are transferred to the previous year's work summary sheet.
nent r to III		Some students may be pursuing learning activities in both Stage II and Stage III. In such cases, teachers in both stages must establish some procedure for observing, prescribing, and keeping records. Also in the Permanent Folder is a complete list of terminal and intermediate objective for the total program. As the student completes one it is checked off. (Required objectives are noted.) This cumulative record will accompany a student who transfers to another school.
ge III r		Stage II Folder becomes Stage III Folder unless it needs to be replaced due to wear.

1.12 Recommendation for Opening Weeks of School

A considerable amount of time has been allocated for the Fort Lincoln School staff to plan and prepare for the opening of school (see Phase I of the Organization/Staffing Plan Volume II, Section 2.) Careful preparation is mandatory for the start of any new enterprise, but doubly so in this case. The staff, the students, and the community will share in the implementation of a distinctly different program in a new and unusual school program with untried procedures. Despite the time and thought that will precede the opening day, not all problems can be anticipated.

To allow time and energy to cope with the unexpected events that may occur, it is suggested that minimal instructional goals be set for the early weeks of school. The intent is to provide a period in which adjustments can be made in procedures, and staff and students can get to know each other and the setting.

Many activities should be carefully planned for the opening weeks of school. However, they should be aimed not toward learning subject matter but rather toward learning the mechanics of the system, so that subsequently attention can be focused primarily on learning. Here are some of the activities that might be considered for this period:

- Physical examinations and sight and hearing tests for all students.
- Joint planning between teachers and students on the arrangement of materials and equipment and rules for their use.
- Tours of the school for all students with exploration of the possibilities it offers for learning.

- Instruction and practice in the proper use and care of audio-visual equipment by the students.
- Individual and group activities that permit the staff to observe the behavioral characteristics and present levels of ability of the students.
- Formal and informal testing.
- Instruction and practice in the use of student records by the students.
- Taking Polaroid(R) photographs (students can do this of each other) to be attached to their stage folders.

This is not to suggest that no learning activities will be taking place but rather that there should be no feeling of pressure to "get started on the syllabus." If the concept of individualized instruction has any validity, the four- to six-week "shake-down" period will not be lost time. The time spent by the student exploring the possibilities of the environment and helping to plan and prepare it will free him to concentrate on tasks of learning.

1.12.1 Student Participation

The way things go the opening days of school can be critical to the future success of the program. It is important that the students feel that this is their school. All details of organization and procedure that they can legitimately determine and implement should be left for them to do. These might include deciding where to store instructional materials and helping to put them away, labelling drawers, devising color or symbol codes to help nonreaders locate places and things and preparing their folders by putting their pictures and names on them (they should be free to decorate them as they wish).

The student helpers who were trained during the summer and other students who participated in the summer program can assist in the orientation of other students, act as tour guides, and help teach the use of equipment and programmed learning materials.

1.12.2 Guidelines for Collection of Diagnostic Data

There are a number of ways by which the teacher can get to know the student both formally and informally. The teacher can begin to get some idea of where her students are by using previously acquired information in the form of test results from past years of schooling.

Informally, time may be arranged for each child to read something appropriate with the teacher. The teacher may take the time to look at a painting or drawing that the child has made, or play a game with an individual child or a small group of children.

More formal diagnostic testing can take place either through the use of well established tests or through comprehensive tests which are available in a few areas (e.g., McGraw-Hill), or diagnostic tests prepared by the teaching staff of Fort Lincoln. While these activities are going on, the students should be given a chance to explore their environment and choose activities they find interesting or appealing. The creative and practical arts and games are especially useful for this, and the way the children behave in these activities can be an important guide to teacher decisions. If the teacher is too busy to be present, another staff member can make an observational report or videotapes can be screened after an event.

During this getting acquainted period, the teacher should make a conscious effort, through staff meetings, meetings with the parents, interviews with the child and possibly with consultant help to reach a tentative decision about the kind of assignment and direction that the student needs. For example, does the student pursue hobbies? Does he work well independently, so that he can be given general responsibility without a great deal of close supervision?

To summarize, the strategy for collecting initial diagnostic data on students is as follows:

- Get to know students.
- While getting to know students, observe students and form a hypothesis about the kind of student activities which would be best for each student.
- While getting to know students make sure that there are sufficient orientation, motivational, and diagnostic activities to engage the student so that the teacher is free to analyze and interact calmly. Observe the students in all their activities either first hand, by report, by video and audio tape, or by the products of the students.
- Use past information from student record folders and interviews with students in forming the instructional hypothesis.
- Begin to make instructional assignments with the student since one of the strategies of Fort Lincoln is to enable the student to make his own educational plans and assignments as soon as he has both the ability and inclination to do so.

A logical procedure to follow during this data-gathering period is for each teacher to concentrate on getting to know the students to whom he is advisor. In this way he can prepare for the initial parent-advisor conference which will result in the first long-term prescription.

1.12.3 Flexibility and Change

Some of the procedures recommended in the education plan for the Fort Lincoln School, and many of the procedures worked out by the staff during the summer may not prove feasible when implemented. While preserving the basic principles on which they were based, these procedures should be modified whenever the evidence indicates that they are interfering with the instructional process. One example will suffice.

The age ranges for the various stages are set at 3-5, 5-7, 7-9, and 9-12. Depending on the exact enrollment of students and their general characteristics, it may make more sense to group them 3-6, 6-8, 8-10, and 10-12. The original intent was to group students according to age and developmental charactersitics with enough overlap to accommodate individual differences in growth and learning patterns.

The students, the staff, and the parents who will share in the implementation and operation of the Fort Lincoln School are the final arbiters in determining the best ways to execute the plan to achieve the goals for which it is designed.

1.13 Supplies and Equipment

1.13.1 Organization

The Equipment List with items cross indexed to specific learning objectives is included with explanatory notes in the Equipment, Supplies, and Budget Section of the Guide to Implementation. A supplementary booklist and recommendations for book purchases are also contained in this section. In addition, a separate Book of Descriptions contains information on equipment items that are:

- Likely to be unfamiliar to teachers
- Expensive
- Comprehensive in scope or sequence

The completed Equipment List specifies equipment and materials recommended for purchase, the number required, the total cost, and the source of supply. A separate list has been prepared for each stage; items in all stages are classified according to:

- Instructional Materials
- Audiovisual Software
- Miscellaneous
- Musical Instruments
- Art and Craft Supplies (including paper, woodworking, sewing, knitting and weaving materials)

Within these broad categories, equipment is further denoted by subject area.

In addition to the sections listing equipment for each stage, there are separate lists of:

- Audiovisual Hardware

- Minimum Standard Indoor/Outdoor Apparatus and Sports Equipment
- Minimum Standard Stationery Items
- Items Recommended for Additional Purchase in All Subject Areas
- Supplies Available from Parents, Students, Teachers, and Other Sources

1.13.2 Standards

Guidelines for the type and quantity of equipment and supplies are primarily from two sources:

Stage I - Nimnicht, G., McAfee, O., and Meier, J.
The New Nursery School.

All Stages - Equipment and Supplies. Bulletin 39.
Washington: Association for Childhood
Education International, 1968.

1.13.3 Budget and Rationale for Expenditures

Investment and operating expenditures for the Fort Lincoln education program and a rationale for these expenditures are presented in the Equipment, Supplies, and Budget Section of the Guide to Implementation.

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APPENDIX A

BIBLIOGRAPHY IN DOCUMENTATION OF RATIONALE FOR EDUCATION PLAN

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APPENDIX B

INSTRUCTIONAL OBJECTIVES EXCHANGE

INSTRUCTIONAL OBJECTIVES EXCHANGE
Center for the Study of Evaluation
Graduate School of Education
University of California
Los Angeles, California 90024

W. James Popham, Director Instructional Objectives Exchange	Marvin C. Alkin, Director Center for the Study of Evaluation

A SERVICE ORIENTATION

The primary service of the Objectives Exchange is to make available alternative objectives and measuring devices to assist school personnel in their instructional and evaluation activities.

HOW TO PARTICIPATE

Participate in the Objectives Exchange by contributing your operationally stated objectives and evaluation measures and by withdrawing objectives and items from the pool which are suitable for your particular instructional situation.

A Symposium Presentation at the
Annual American Educational Research Association Meeting
Los Angeles, February 5-8, 1969

OBJECTIVES AND INSTRUCTION

W. James Popham
Center for the Study of Evaluation
University of California, Los Angeles

"The quality of any instructional sequence must be evaluated primarily in terms of its ability to promote desirable changes in the intended learner." This assertion, or statements similar to it, have met with increasing approbation among influential American educators during recent years. Not that it represents a novel conception; one could undoubtedly locate comparable utterances from the very beginnings of educational history. But the increasingly widespread agreement with this conception of instructional effectiveness is new. Never before in this country have we had so many educators manifesting commitment to the notion that we should judge instruction primarily by the results it produces in learners.

Criterion-Referenced Instruction

Perhaps the type of instructional strategy being advocated these days can best be described as criterion-referenced instruction. This approach to instruction focuses primarily on the degree to which the learner can perform specified criterion behaviors. For example, in preparing instructional materials the developers decide what to revise on the basis of learner performance data, not according to the judgment of consulting experts. Or in another situation, a school district decides to select one set of supplementary reading texts instead of another because of pupil performance on related criterion tests, not because one set of texts is more attractively illustrated than the other. Such examples accurately suggest that a primary feature of criterion-referenced instruction is a preoccupation with the results of instruction, not the procedures used to promote them. It reflects an ends-oriented approach to instruction rather than means-oriented approach. Since most educators concur that the ultimate index of an educational program's worth is the degree to which it benefits the learner, the increased support of criterion-referenced instructional approaches is gratifying.

But against the increasingly supportive backdrop, it is distressing that very few large-scale criterion-referenced instructional operations are underway. Verbal support is there. Widespread practical implementation there is not. Why?

A Time-Consuming Task. The principal deterrent to expanding the extent of criterion-referenced approaches used in the nation's schools is fairly easy to identify. Developing criterion measures of sufficient quality and satisfactory breadth is too much work for most educators. Developments regarding the use of behaviorally stated educational objectives may be instructive here.

Much of the recent agitation regarding the desirability of describing instructional objectives in terms of measurable learner behavior is based on the belief that operationally stated objectives will more readily permit educators to assess the impact of instruction where it should be assessed, namely, in modified learner behavior. But many proponents of operationally stated educational objectives are beginning to complain about the paucity of such objectives in the schools. Educators can be informed of the merits of behaviorally stated objectives; they can be taught to state objectives properly; they can even become quite enthusiastic about the desirability of stating objectives behaviorally. But few of them do it. The reason is not unwillingness but, instead, reflects a lack of wherewithall. Teachers are already too burdened to find the time to develop operationally stated objectives for their classes. School districts have already committed their increasingly limited resources to other tasks. In those isolated instances where there has been an effort to develop precise instructional objectives on a large scale, the participating educators will readily admit how taxing the enterprise has been.

Imminent Duplication. The financial and personnel costs of the isolated projects to develop instructional objectives points up another problem. In spite of the difficulties associated with the development of explicit objectives, some districts are undertaking the task. For example, several months ago the Clark County, Nevada School District developed a set of behaviorally stated objectives for mathematics instruction, grades K through 6. There are other examples of such endeavors in various parts of the U. S.

The absence of any scheme through which one district could become aware of the existence of similar developmental projects makes it probable that a distressing amount of duplication will occur among those few educators who are zealous enough to attempt the development of precise instructional aims. For instance, more than a year after the Clark County, Nevada schools had completed their preparation of K-6 instructional objectives for mathematics, two districts in different states commenced work on precisely the same project. They were unaware of the Clark County objectives. The wheel was about to be re-invented.

Not that the Clark County objectives would satisfy all districts; undoubtedly there would be modifications. But the energy that could be saved nationally by adapting extant sets of objectives rather than starting from scratch, is incalculable. For example, several of the USOE-supported regional laboratories are investing significant resources in encouraging educators to develop operationally stated goals. The probable overlap between such efforts and similar projects initiated by local districts is considerable.

Objective-Generators and Objective-Selectors

It has become increasingly clear to those who have been promoting the use of operationally stated objectives that it may be expecting too much to ask already harassed teachers and administrators to generate their own objectives. It is an arduous task and, although the teacher may be willing to state his objectives behaviorally, under present conditions most teachers just can't find the time to do it. But though objective-generation may be too demanding, objective-selection should not be. If the instructor's task were simply to choose from comprehensive sets of operationally stated objectives those which he wished to achieve, his task would be manageable. He could follow through on his commitments to precisely explicated goals without being obliged to construct all such goals himself. But, obviously, someone needs to construct the objectives from which he can select.

Local Option. Under any scheme in which the educator is the selector rather than generator of objectives there may be some concern regarding the degree to which the objectives will be "imposed from above." A viable objectives selection scheme, however, should permit just that - the selection of objectives. If particular objectives are not preferred, they are not selected. If all of the objectives are not available which the selector favors, he can always generate additions. Having selected the bulk of his goals from those prepared by others, such an objectives generation task should be manageable. Local autonomy in the selection of objectives should be an integral part of any objectives selection scheme. The availability of objectives from which to choose should increase the educator's range of alternatives, never decrease his self-direction.

Objectives Plus Criterion Measures

Another factor which has not been perceived by all advocates of precise objectives is that they may be necessary, but by themselves they are far from sufficient. Too often even a behaviorally stated objective may be used as window dressing for "instruction as usual." A precise objective can be most helpful when planning an instructional sequence, since there is clarity regarding the intended post-instruction competencies of the learner. But an explicit objective becomes even more useful when we evaluate an instructional sequence. This can be accomplished by ascertaining the degree to which the objective has been achieved. To perform the latter function we need measuring devices based explicitly on the objective. A criterion-referenced approach to instruction requires criterion measures.

Few districts have made this logical jump from the development of objectives to the necessity of developing test items. And "test items" here is used in the broadest possible sense, for example, including observation of learner behaviors reflecting a host of cognitive as well as non-cognitive outcomes. If it were possible for school districts to have access to sets of objectives plus test items from which they could choose, then after selecting certain objectives the district could readily assess the degree to which its instructional approaches were successful. A teacher could evaluate his success in achieving his goals. The existence of a pool of test items for each objective would really encourage educators throughout the nation to initiate criterion-referenced instructional strategies.

The Instructional Objectives Exchange

Therefore, to encourage increasing numbers of educators to adopt criterion-referenced instructional strategies and to reduce the probable overlap in objective development efforts, the UCLA Center for the Study of Evaluation has established the Instructional Objectives Exchange which will serve as a national depository and development agency for instructional objectives and related measurement devices. The Exchange will perform the following functions:

1. It will serve as a visible clearinghouse which can be used to keep abreast of the diverse instructional objectives development projects throughout the nation.

2. It will provide a bank-like agency whereby a school district (or comparable educational agency) can "draw out" all objectives and relevant measures for as many subjects, grades, topics, etc. as desired.

3. It will continually update, refine, and expand the pool of objectives and measures for each field covered by the Exchange.

The potential impact of such an Exchange, readily providing pools of objectives and test items from which districts can select, should not be underestimated. With competent staffing, a careful developmental plan, and proper dissemination strategies, the Exchange could conceivably alter the nature of instructional practice in America.

Operation of the Exchange

Briefly, this is how the Exchange will function. First, an attempt will be undertaken to make as many educators as possible aware of the existence of the Exchange and the service it provides. We have already distributed nationally news releases, magazine articles, letters to school districts, thousands of descriptive brochures, etc. Contained in this literature describing the Exchange is a request that any school district or comparable agency which has developed behaviorally stated instructional objectives contribute those to the Exchange. We are currently in the process of collecting the initial sets of these objectives, and while it is too early yet to say how many collections of behaviorally stated objectives exist throughout the country, there are encouraging indications that there may have been more projects focused on the development of precise objectives than we had anticipated.

As this collection activity progresses, the staff of the Exchange will concurrently be developing objectives and related item pools, particularly in those areas where we find few satisfactorily stated objectives. We are now refining our procedures for developing properly stated objectives and criterion-referenced items which accurately reflect the attainment of such objectives. Although our early efforts have quite naturally found us emphasizing cognitive objectives, we hope to move soon to the development of a variety of non-cognitive goals. Our current developmental activities are in the fields of mathematics, language arts, and social studies.

After we have developed or collected a respectable number of objectives and related items, the Exchange will make these available to the schools. A school district will identify the fields and grade levels in which it is interested, then receive the entire collection of objectives suitable for those areas. The district will then select the objectives appropriate for its peculiar instructional situation and will receive a pool of measurement items for each objective selected. We hope to provide a series of categorization rubrics which will aid local school personnel in the selection of appropriate goals. Since we anticipate that the objectives retrieval system will be computer-based, a host of interesting categorization possibilities should be available.

Since the Instructional Objectives Exchange is a project of the UCLA Center for the Study of Evaluation, we will be particularly attentive to the manner in which educators employ the Exchange system for evaluative purposes. A major project of the Center is devoted to the appraisal of this system in terms of the relationship between objectives, instruction, measurement, and evaluation.

Although there are important procedural details which will not be discussed here because of space limitations, the foregoing remarks should provide a general idea of how the Objectives Exchange will function.

Impact Potential

Because of its avowed purpose to make it easier for American educators to engage in criterion-referenced instruction, the possible influence of the Instructional Objectives Exchange could be considerable. Because of the orientation of the Exchange staff, judgment regarding whether the objectives exchange concept is a serviceable one will await the analysis of results in the field. Logically, the idea of permitting educators to be objective selectors rather than generators has great appeal. But logic has not always been the dominant theme in American educational practice. We can hope, but we'll have to see.

APPENDIX C

PARENTS' HANDBOOK OUTLINE

Suggested Outline for Parents' Manual

I. Brief history of Fort Lincoln (Refer to page location in the back of the Manual for school staff names and titles.)

II. School calendar

  A. Hours and days school is open

  B. Hours and days Resource Center is open

III. Physical location of the school

  A. Map of District with placement of FLNT and of school attendance area

  B. Map of building by stage

  C. Fire and safety regulations for the building

IV. Description of educational program

  A. General goals — as specified in contract

  B. Specific goals and procedures

    **1. Individualized instruction with specific plans for each child, both long range and short range

    2. Performance objectives to meet these goals for children. Explanation of why objectives are used instead of a curriculum outline (general and brief); explanation of varying difficulty of objectives as a factor in length of time necessary to complete them

    3. Use of self instructional materials and interaction with objects with description of how the child is expected to benefit from this approach

    4. Types of group situations for the child to participate in

    **5. Student decisions about the program

    6. What parents may expect of the child as a result of this program

      a. First month

**Denotes sections where special attention should be given to describing how the parents can help their children.

b. After a year

c. Variability of interest, rate, etc., but mastery at end of Stage IV

7. Continual testing -- pre- and posttests, comprehensive tests and charting of behavioral characteristics. (Consider including sample forms)

**8. Assignment of students to stages; explanation of parental role in determining progression from stage to stage

V. School attendance

A. Hours and days open

B. Minimum hours student expected to attend

**C. Explanation of how school and parents determine exact hours a student is expected to be present. Include sample forms.

D. Decisions of who is responsible for a student who stays at school longer than required hours

E. What child is likely to do at school if he stays longer than required time -- activities, degree of help from school staff

F. Vacation time

VI. Parent conferences and reporting to parents

A. Frequency

1. When first one of the year expected to occur

2. Conferences available on demand, average frequency expected

3. Records always available

B. Format

1. Written (include sample)

2. Videotape

3. Projects by student

4. Conference with teacher

**VII. Parent help in deciding what the student will study (overlap with IV)

- A. Time
- B. Subject
- C. Proficiency level
- D. Homework
  - 1. Discretion of parents and student option
  - 2. Availability of guidance from staff about how to help their children at home

VIII. Visits to school

- A. For parents.
  - 1. Procedures
  - 2. Use of CCTV
  - 3. Limitations on visiting and observing (i. e. do not interrupt a student taking a test)
  - 4. Procedures for helping with instruction during visit, if desired
- B. For general public

IX. Evaluation of the School (student and teacher performance; materials quality and appropriateness)

- A. By parents
- B. By separate evaluation staff

XI. Resources and services

- A. Community resources the school hopes to use and which parents may want to explore with their children. List addresses and/or persons to contact
- B. The school as a resource to the community
  - 1. Hours the school is available for special activities such as adult education programs

**2. Materials in the school available to parents

   a. Procedures for getting the materials (may have to be able to operate a projector to take one home)

   b. Responsibility for materials

   c. Hours Resource Center open to parents

   d. Length of time materials may be checked out

C. Arrangements for special uses of school facility — i.e. for a community fund.raising project, meetings

D. Services to parents and students which can be requested from the D.C. school system (overlap with XVI B and may not be necessary).

   1. List of services

   2. Personnel to contact

XI. PTA Council and Community Council

   A. Responsibilities

   B. Procedures for becoming a member

XII. Opportunities for parents to work with instructional staff

   A. Volunteers

      1. Type of work

      2. Frequency and length of tasks

      3. Whom to contact if interested

   B. Career ladders

      1. Steps

      2. Whom to contact if interested

   C. Things to contribute (a suggested list is included with the Equipment List)

XIII. Lunchroom facilities

XIV. Special discipline problems

XV. Glossary of terms that may be new to the parents and which children are likely to use because of their work in the school (student profile, criterion performance, names of sets of materials such as IPI or PLAN)

XVI. Names, titles, phone numbers, hours (for part-time personnel) of personnel to contact for various reasons

  A. School staff roster including aides, teachers, secretaries, maintenance staff, and others

  B. District personnel -- procedures for contacting, if different from school procedures

  C. Special Projects Division

  D. Members of the community board

  E. Members of PTA board or council (if different from the community board)

  F. Members of FLNT citizens advisory council

XVII. Index

APPENDIX D

MODEL REPORT FORM TO PARENTS

Form for Reporting to Parents

The form for reporting to parents which follows involves teachers, students, and parents in the evaluation process for Stages II through IV. The three sections of the form are developed from the stated aims of the Fort Lincoln School: acquisition of knowledge and skills; development of personal interests; and growth in positive self-concept.

The first section of the report requires that both student and teacher respond. Teachers (or aides) are asked to note the number of required and optional objectives selected and completed for all subject areas. This information on objectives is found on a form in the stage folder entitled "Objectives Completed to Date", Appendix I, Figure II. Requirements for completion of objectives are detailed in Appendix I, Figure E1-E4. Teachers will also need to consult the Long-term Prescription form in order to complete part 1. This form is contained in the permanent folder. A sample form is located in Appendix I, Figure G.

Part 2 of the report asks the student to reflect upon and record his own strengths and personal talents.

Part 3 asks the student and teacher to discuss the student's social development and growth in positive self-concept. The student and teacher will review the Fort Lincoln objectives which deal with the student attitudes and behaviors, and come to an agreement on the student's strengths in the 11 areas listed. Disagreements can be noted by either party. These objectives are defined in much greater detail in the Objectives for Fort Lincoln Elementary School, social studies objectives 1-11. The teacher will indicate unusual behavior problems, then comment in writing on overall opinions of performance.

Parents are encouraged to respond to the report. In Stage 1 nearly all reporting and discussion of the students will occur in person at home or in school.

Report to Parents → From ____

Name ________________ Date ________

1. **Aim:** Acquisition of the knowledge and skills necessary for continuing education and career advancement.

Progress: I am showing greatest progress in (subject) ________________

____

Student

Objectives completed to date

Required

Mathematics: Stage Req. ______ Completed ______
Reading: Stage Req. ______ Completed ______
Communications: Stage Req. ______ Completed ______
Health: Stage Req. ______ Completed ______

Optional (must complete __% of those selected)

Arts: Min. Selection ______ Completed ______
Social Studies: Min. Selection ______ Completed ______
Science: Min. Selection ______ Completed ______
Physical Ed.: Min. Selection ______ Completed ______

Initials ____

Teacher or Aide

Progress on Long-term Prescription (see Long-term Prescription)

What progress has been noted since last report?

____

____

____

____

What revisions have been made since the Long-term Prescription was made?

Date	Revision

Initials ____

Teacher

2. **Aim:** Development of personal talents or interests.

Progress: My independent study or research project was ______________________

____

Committees or clubs I enjoy are ______________________________

____

A trip or group activity I enjoyed was ________________________

____

I am most pleased with ______________________________________

____

Student

3. **Aim:** Growth in positive self concept and sensitivity to others and to the environment.

Progress: Attitude and behavior objectives where strengths exist –
(circle number)

1. Has respect for self.
2. Respects the integrity and the dignity of other individuals.
3. Accepts responsibilities of membership and citizenship in family, school, community, and nation.
4. Is a loyal friend.
5. Believes in the rational settlement of disputes.
6. Respects truth and honesty.
7. Appreciates the diversity of mankind.
8. Respects the natural environment and the beauty of nature.
8. Examines social issues in an open, rational manner.
10. Shows awareness of social issues.
11. Is committed to an open, democratic society with equality of opportunity and justice for all.

Teacher and Student

Behavior (see Behavior and Interest Information)

Behavior	-	Average	+
Tolerance of others			
Persistence			
Acceptance of criticism			
Ability to relax			
Self confidence			
Attention span			

Initials ______

Teacher

Comments on Behavior: ____________________

____

____

From the Teachers

Teachers are invited to comment on the student for this report period.

____

____

____

____

____

____

____

I encourage:

More home practice in ____________________

More concentration at school on ____________________

Special private instruction in ____________________

A conference with parents and student to revise the student's program ____

____

Signed ____________________

Teacher

From the Parents

Please check or fill in the following for further information.

I would like a conference with the teacher ____________________

I would like further information on how I might help my child with ____

____

____

____

____

Signed ____________________

Parents

3

APPENDIX E

SAMPLE ACTIVITY SHEETS

Activities

Level or Stage C Unit Classifying 6

Inter. Obj.	Source	Activity	Location	Remarks
CL6a	CENCO	Aquarium	II, III	
CL6a	CENCO	Living Plants, Animals	II, III	
CL6a	Dept. of Commerce	Aquarium		
CL6a	Hains Point	Aquarium		
CL6a	Kenilworth	Aquatic Gardens		
CL6a	Instructo	Characteristics of Fish	III	Overlays
CL6a	ESS (Webster)	Pond Water	III-IV	Unit of materials
CL6b	Doubleday	A Trip to a Pond	IV	Book
CL6b	Doubleday	Let's Go to the Brook	II	Book
CL6b	Doubleday	Shape of Living Things	III	Book
CL6b	Instructo	Discovering sets	II	Overlays
CL6c	EIS (Webster)	Living Things	II	Grade 2 unit

Activities

Level or Stage II Unit Writing (C. S. I)

Inter. Obj.	Source	Activity	Location	Remarks
1.09	Montessori	Sandpaper Alphabet	I	
1.09	Sullivan	Pre Reader	II	Workbook
1.09	Open Court	Pre Primer	II	Workbook
1.09	Hammett	Manuscript Writing Recorders	II	2 Workbooks
1.09	Hammett	Writing Frame	II	Teachers hand position
1.09	Hammett	Alphabet Guide Charts	II	
1.09	Webster/McGraw	Reading Seatwork	II	Preprimer-First
1.09	MacMillan	Adventures in Handwriting	II	Grade I
1.09	SRA	Learning to Think	II	K-1

Activities

Level or Stage A Unit Visual Discrimination

Inter. Obj.	Source	Activity	Location	Remarks
1	IPI	Worksheets	II	
1	CENCO	Reading Readiness	II	Filmstrips 1, 2, 4, 20, 21
1	SRA	Detect	II	Game
1	SRA	The Red Book	II	Pgs. 5, 11, 16, 23, 31,
				38, 41, 54, 62, 68, 73, 77.
2	IPI	Worksheets	II	
2	SRA	The Red Book	II	Pgs. 56, 70.
3	IPI	Worksheets	II	
3	CENCO	Reading Readiness	II	Filmstrip 3
3	SRA	The Red Book	II	Pgs. 6, 27, 37, 48, 57.
4	IPI	Worksheets	II	
4	CENCO	Reading Readiness	II	Filmstrips 1, 2, 4.
4	CENCO	Preprimer Reading	II	Filmstrips 1, 2, 3, 4, 5.
4	SRA	Detect	II	Game
5	IPI	Worksheets	II	
5	Sullivan	Readiness in Language Arts	II	
5	SRA	Detect	II	Game
5	Sullivan	Reading Readiness	II	Programmed
6	IPI	Worksheets	II	
7	IPI	Worksheets	II	
7	Sullivan	Reading Readiness	II	Programmed Bks. B-D
8	IPI	Worksheets	II	
8	Hammett	ABC Picture Board and	II	Game
		Speller		
9	IPI	Worksheets	II	
9	CENCO	Reading Readiness	II	Filmstrip 7
9	Milton-Bradley	Color Recog. Flannel Bd.	II	
9	CENCO	Color Wheel	II	
10	IPI	Worksheets	II	
10	Sullivan	Readiness in Lang. Arts	II	
10	Webster/McGraw	Colors and Their Names	II	Colors, Unit II, 8mm
				filmloop and activity bks.
11	IPI	Worksheets	II	
11	Knowledge Aid	Picture Dictionary	II	Pg. 3, "Color Names"
12	IPI	Worksheets	II	

Activities

Level or Stage A Unit Numeration

Inter. Obj.	Source	Activity	Location	Remarks
1	Encyclopedia Brit.	Taller? Shorter? Larger?	I	Arithmetic for Beginner
		Smaller?		Series I, Filmstrip 6.
2	CENCO	Count to Ten	I	Book
2	Encyclopedia Brit.	How Many?	I	Arithmetic for Beginners
				Series I, Filmstrip 3.
2	Sullivan	Readiness in Math	I	Teacher Led
3	Encyclopedia Brit.	Recognizing Numbers	I	Arithmetic for Beginners
				Series I, Filmstrip 5.
3	Sullivan	Readiness in Math	I	Teacher Led
5	CENCO	Arithmetic for Beginners	I	Counting Game
5	Wiley	Mathematics Begins	I	Teacher Led
5	IFB	Fun With Sets	I	Filmstrip
5	Sullivan	Readiness in Math	I	Teacher Led
6	Hammet	Seat Work in Counting	I	Numbers and Sets
6	Sullivan	Readiness in Math	I	Teacher Led
7	Montessori	Counting Tray	I	
7	CENCO	Number Concept Cards	I	
7	McGraw-Hill	What is Four	I	Film
7	Montessori	First Counting	I	
7	Montessori	Counting and Numbers	I	
9	SRA	The Red Book	I	Pgs. 53 and 61.
9	Wiley	Mathematics Begins	I	Teacher Led
9	CENCO	Arithmetic for Beginners	I	Counting Game
10	Sullivan	Readiness in Math	I	Teacher Led
11	Ideal	Number Readiness Posters	I	Trace Numbers

APPENDIX F

DESCRIPTIONS OF OTHER CURRICULUM DEVELOPMENTS

Wisconsin Research and Development Center
for Cognitive Learning

Individualized Mathematics System

Electronic Learning, Inc. Mathematics Program

Elementary Science Programs

Project PLAN

UNIPAC Program, Materials Dissemination Center

Excerpts From

A STATEMENT OF SKILLS AND OBJECTIVES FOR THE WISCONSIN PROTOTYPIC SYSTEM OF READING SKILL DEVELOPMENT

By Wayne Otto and Joe Peterson

Report from the Individually Guided Instruction
in Elementary Reading Project
Wayne Otto, Principal Investigator

Wisconsin Research and Development
Center for Cognitive Learning
The University of Wisconsin
Madison, Wisconsin

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Center No. C-03 / Contract OE 5-10-154

STATEMENT OF FOCUS

The Wisconsin Research and Development Center for Cognitive Learning focuses on contributing to a better understanding of cognitive learning by children and youth and to the improvement of related educational practices. The strategy for research and development is comprehensive. It includes basic research to generate new knowledge about the conditions and processes of learning and about the processes of instruction, and the subsequent development of research-based instructional materials, many of which are designed for use by teachers and others for use by students. These materials are tested and refined in school settings. Throughout these operations behavioral scientists, curriculum experts, academic scholars, and school people interact, insuring that the results of Center activities are based soundly on knowledge of subject matter and cognitive learning and that they are applied to the improvement of educational practice.

This Working Paper is from the Individually Guided Instruction in Elementary Reading Project in Program 2. General objectives of the Program are to establish rationale and strategy for developing instructional systems, to identify sequences of concepts and cognitive skills, to identify or develop instructional materials associated with the concepts and cognitive skills, and to generate new knowledge about instructional procedures. Contributing to these Program objectives, the Reading Project staff, in cooperation with area teachers, prepared a scope and sequence statement of reading skills for the elementary school as a first step in the development of an instructional program. From this outline, assessment procedures and group placement tests have been developed, and existing instructional materials have been keyed to the outline. Research is conducted to refine the program and to generate new knowledge which will be incorporated into the system.

OUTLINE OF READING SKILLS

I. Word Attack

Level A

1. Listens for rhyming elements
    a. Words
    b. Phrases and verses
2. Notices likenesses and differences
    a. Pictures (shapes)
    b. Letters and numbers
    c. Words and phrases
3. Distinguishes colors
4. Listens for initial consonant sounds

Level B

1. Has a sight word vocabulary of 50-100 words
2. Follows left-to-right sequence
3. Has phonic analysis skills
    a. Consonant sounds
        1) Beginning
        2) Ending
    b. Consonant blends
    c. Rhyming elements

Word Attack

  - d. Short vowels
  - e. Simple consonant digraphs

4. Has structural analysis skills
  - a. Compound words
  - b. Contractions
  - c. Base words and endings
  - d. Plurals
  - e. Possessive forms

V

OBJECTIVES FOR WORD ATTACK, COMPREHENSION, AND STUDY SKILLS

I. Word Attack

Level A

1. Listens for rhyming elements

a. Words

OBJECTIVE

The child is able to tell when (a) two words pronounced by the teacher (man-pan, call-bell, when-pen) and/or (b) the names of two objects, do and do not rhyme (i.e., "sound alike").

b. Phrases and verses

OBJECTIVES

1. The child is able to pick out the rhyming words in traditional verses (i.e., "Little Jack Horner Sat in a Corner") and nonsense verses ("Wing, wong, way - Tisha, loona say") read by the teacher.

2. The child is able to supply the missing word in a rhyming verse read by the teacher (e.g., "The big tall man— Fried eggs in a ______________.")

Word Attack

2. Notices likenesses and differences

   a. Pictures (shapes)

      OBJECTIVE

      The child is able to match key shapes with shapes that are identical in terms of form and orientation. (e.g.,).

   b. Letters and numbers

      OBJECTIVE

      The child is able to pick the letter—upper of lower case—or number in a series that is identical to a key number or letter. [The child points to the letter or number that is the same as the first letter or number in a row: P: B T P K; s: s z e c; 9: 6 0 9 8].

   c. Words and phrases

      OBJECTIVE

      The child is able to pick the word or phrase in a series that is identical to a key word or phrase: (e.g.,

      down: wand - down - bone - find;

      back and forth: bank and find - back and forth- found it)

3. Distinguishes colors

   OBJECTIVE

   The child is able to identify colors—i.e., blue, green, black, yellow, red, orange, white, brown, purple—named by the teacher. [The child picks from four choices the color named by the teacher, e.g., key word = blue, color choices = blue and black; the child chooses the proper crayon to fill in boxes with the colors named by the teacher.]

4. Listens for initial consonant sounds

OBJECTIVE

Given two common words pronounced by the teacher (e.g., bird-ball, boy-take, banana-dog), the child is able to tell when the words do and do not begin alike

Level B

1. Has a sight word vocabulary of 50-100 words

OBJECTIVE

Given a maximum 3-second exposure per word, the child is able to recognize 92 Preprimer and Primer level words selected from the Dolch Basic Sight Vocabulary List of 220 words.

NOTE: The specific Preprimer and Primer words are given in the list on the next page. The child should be able to recognize additional sight words that occur in instructional materials to which he has been exposed.

2. Follows left-to-right-sequence

OBJECTIVE

The child reacts to number, letter or word stimuli in a left-to-right sequence. [The child names the letters or numbers presented in rows—

N	C	H	P
c	o	e	g
4	7	1	2—

in a left-to-right sequence].

BREAKDOWN OF THE DOLCH BASIC WORD LIST BY LEVELS

Preprimer	Primer	First Grade	Second Grade	Third Grade
1. a	1. all	1. after	1. always	1. about
2. and	2. am	2. again	2. around	2. better
3. away	3. are	3. an	3. because	3. bring
4. big	4. at	4. any	4. been	4. carry
5. blue	5. ate	5. as	5. before	5. clean
6. can	6. be	6. ask	6. best	6. cut
7. come	7. black	7. by	7. both	7. done
8. down	8. brown	8. could	8. buy	8. draw
9. find	9. but	9. every	9. call	9. drink
10. for	10. came	10. fly	10. cold	10. eight
11. funny	11. did	11. from	11. does	11. fall
12. go	12. do	12. give	12. don't	12. far
13. help	13. eat	13. going	13. fast	13. full
14. here	14. four	14. had	14. first	14. got
15. I	15. get	15. has	15. five	15. grow
16. in	16. good	16. her	16. found	16. hold
17. is	17. have	17. him	17. gave	17. hot
18. it	18. he	18. his	18. goes	18. hurt
19. jump	19. into	19. how	19. green	19. if
20. little	20. like	20. just	20. its	20. keep
21. look	21. must	21. know	21. made	21. kind
22. make	22. new	22. let	22. many	22. laugh
23. me	23. no	23. live	23. off	23. light
24. my	24. now	24. may	24. or	24. long
25. not	25. on	25. of	25. pull	25. much
26. one	26. our	26. old	26. read	26. myself
27. play	27. out	27. once	27. right	27. never
28. red	28. please	28. open	28. sing	28. only
29. run	29. pretty	29. over	29. sit	29. own
30. said	30. ran	30. put	30. sleep	30. pick
31. see	31. ride	31. round	31. tell	31. seven
32. the	32. saw	32. some	32. their	32. shall
33. three	33. say	33. stop	33. these	33. show
34. to	34. she	34. take	34. those	34. six
35. two	35. so	35. thank	35. upon	35. shall
36. up	36. soon	36. them	36. us	36. start
37. we	37. that	37. then	37. use	37. ten
38. where	38. there	38. think	38. very	38. today
39. yellow	39. they	39. walk	39. wash	39. together
40. you	40. this	40. were	40. which	40. try

BREAKDOWN OF THE DOLCH BASIC WORD LIST BY LEVELS (cont.)

Preprimer	Primer	First Grade	Second Grade	Third Grade
	41. too	41. when	41. why	41. warm
	42. under		42. wish	
	43. want		43. work	
	44. was		44. would	
	45. well		45. write	
	46. went		46. your	
	47. what			
	48. white			
	49. who			
	50. will			
	51. with			
	52. yes			

3. Has phonic analysis skills

   a. Consonant sounds

      1) Beginning

OBJECTIVES

1. Given two common words pronounced by the teacher (e.g., man-pet, ball-boy), the child is able to tell when the words begin alike. (review)

2. Given a real or nonsense word pronounced by the teacher, the child is able to give the letter that makes the initial sound.

3. Given a word pronounced by the teacher, the child is able to give another word that begins with the same sound.

      2) Ending

OBJECTIVES

1. Given two common words pronounced by the teacher (e.g., bat-hut, six-sit), the child is able to tell when the words do and do not end alike.

2. Given a word pronounced by the teacher (e.g., bat, car), the child is able to give the letter that makes the ending sound.

b. Consonant blends

OBJECTIVES

1. When directed to listen for the first two sounds—i.e., pl, gr, pr, cr, fl, cl, bl--in a real or nonsense word pronounced by the teacher, the child is able to (a) identify words that begin with the same two sounds and (b) identify the two letters that make the initial sounds. [(a) From a series of three pictured objects the child selects the one(s) with names that begin with the same two sounds as the word enunciated by the teacher: drink (pronounced) . . . drum, table, dress (pictures). (b) From a series of four two-letter combinations, the child selects the pair that makes the initial sounds of the word enunciated by the teacher.]

2. The child is able to pronounce real and nonsense words that begin with the following blends: pl, gr, pr, cr, fl, cl, bl, gl. [Some examples of appropriate nonsense words: plag, gref, prid, flin.]

c. Rhyming elements

OBJECTIVE

Given a word pronounced by the teacher (e.g., pan, ball, sat), the child is able to give a rhyming word.

NOTE: A rhyming nonsense word should be considered an acceptable response.

d. Short vowels

OBJECTIVE

The child is able to give the sound and letter name of the vowel in single syllable words with a single short vowel sound (e.g., man, duck, doll, hop).

e. Simple consonant digraphs

OBJECTIVE

The child is able to identify simple two-consonant combinations—ch, th, sh—that result in a single new sound. [The child is asked to identify the digraphs (i.e., two consonants with a single sound) in words enunciated by the teacher: she, chaff, teeth, fish, beach.]

4. Has structural analysis skills

a. Compound words

OBJECTIVE

The child is able to identify compound words and to specify the elements of a compound word. [The child identifies the compound word in a sentence and specifies the component words: The football went over the fence.

b. Contractions

OBJECTIVE

The child is able to identify simple contractions (e.g., I'm, it's, can't) and use them correctly in sentences.

c. Base words and endings

OBJECTIVE

The child is able to identify the root word in known inflected words (e.g., jumping, catches, runs).

d. Plurals

OBJECTIVE

The child is able to tell when known words—essentially noun plus s forms—are singular or plural (i.e., indicate one or more than one).

e. Possessive forms

OBJECTIVE

The child is able to identify the possessive forms of nouns in context. [The child indicates the under-scored words in connected text that are possessive forms.]

IMS OVERVIEW

Preface

The development of IMS has come about in response to actual classroom experiences with an earlier individualized mathematics program, as well as through further exploration of existing research in child development and learning.

That earlier program, IPI (Individually Prescribed Instruction), is a product of the Learning Research and Development Center in Pittsburgh. Although it has certainly shown its worth as a procedure which allows children to learn mathematics at their own rate rather than at a single group pace, a number of changes have been suggested by teachers and others closely involved with its implementation. IMS is the outgrowth of these suggestions.

As an important step in the developmental process, IMS will be field tested in a number of schools in the current year and in 1970-71. It is expected that the improvements it incorporates will make it a most effective program for meeting the needs of pupils on an individual basis while giving teachers a varied and creative role, and, at the same time, providing a system which is economically feasible for widespread use in public schools.

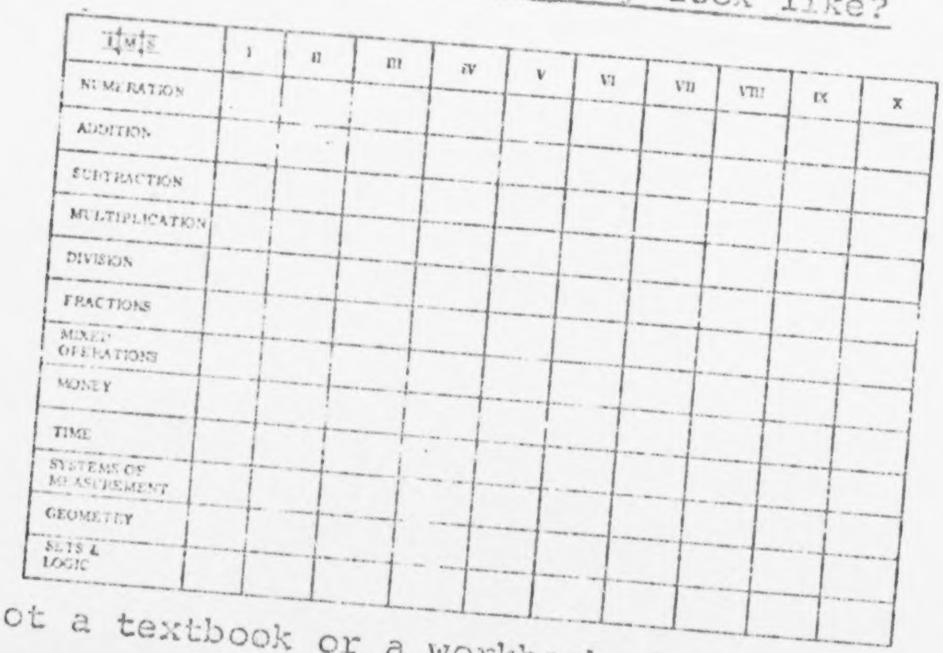
For further information contact:

The Regional Education Laboratory
for the Carolinas and Virginia
613 Vickers Avenue
Durham, North Carolina

What is it?

IMS, Individualized Mathematics System, is just that: a system, or organization of materials, which presents the necessary skills of elementary mathematics in a logical succession of separate steps, most of which children can master by working on their own in the classroom. In a way, IMS is based on the truth of an old maxim: "Nothing succeeds like success." With each step that is accomplished, a child is highly motivated to move on to the next.

What are the materials and what do they look like?



IMS	I	II	III	IV	V	VI	VII	VIII	IX	X
NUMERATION										
ADDITION										
SUBTRACTION										
MULTIPLICATION										
DIVISION										
FRACTIONS										
MIXED OPERATIONS										
MONEY										
TIME										
SYSTEMS OF MEASUREMENT										
GEOMETRY										
SETS & LOGIC										

IMS is not a textbook or a workbook, but a sequence of separate work pages covering the skills of elementary mathematics from a number of different angles. Illustrations are widely used throughout and teacher-directed activities, student projects, and the use of a large number of manipulative devices are written directly into the program.

The sequence of separate pages is organized into folders by skills, starting with the most basic area in mathematics, numeration, and its most simple skills. Each area at each level has several skills to be acquired and those skills comprise a unit. For example, for the next unit in that area, or a different one. He will take the pre-test for the unit and his teacher will again prescribe the applicable pages or activities. (An interesting point is that IMS allows that some students, in time, may be able to write their own prescrptions.) However, if the post-test showed lack of mastery (a score below 85%) his teacher will again note in what skills he was deficient, and assign or prescribe more work sheets, or activities, in those skills.

Naturally, there are stumbling blocks, but the possibilities for solutions are many. Some students will need individual help from the teacher fairly often. Other students, working on group projects, are encouraged to help one another. Sometimes, a teacher may group several students together for purposes of explaining a particular problem, for working pages together, or for some other teacher-directed activity. In other words, the classroom may be organized to make use of IMS materials in many ways. But the fact remains: each child is being taught individually because he is moving at his own pace, in a program tailored by his teacher to fit his own needs.

What is the teacher's role?

Because the IMS program enables children to work alone much of the time, the teacher's role is clearly somewhat different than it was in the traditional textbook approach to mathematics. It is certainly no less important, however. In IMS the teacher directs a number of learning activities--that is, they teach--but with small groups or individuals, rather than with the class as a whole. They must know when and how to administer the tests that are an integral area 1, Numeration, at Level I has eleven; those eleven skills at Level I make up the first unit in Numeration. Area 4, Multiplication, at Level V has seven. Those seven skills at Level V make up the fifth unit in Multiplication. Area 7, Mixed Operations, at Level X has two. Those two skills at Level X make up the tenth unit in Mixed Operations, and so on.

There are 120 such units in IMS, since there are twelve areas which can be studied at each of the ten levels. And each unit contains two to eleven skills to be acquired, a total of approximately 500 skills.

Since constant evaluation is essential to any individualized program, IMS provides four kinds of tests: the placement test (nine--one for each level except the first), the pre-test (one for every unit except three in Level I), short skill check-up tests (about 1,000; two for each skill in every unit), and post-tests (120--one for every unit at every level).

Obviously, this is a tremendous amount of material, and teachers, with their well-honed sense of what is practical and what is not, may wonder how it can all be managed in a classroom. The answer is a unique mobile storage unit which has been especially developed for the system. It provides simplified filing space for skill folders and tests, as well as easy access to these materials for children. The whole system can be moved from class to class as needed, and no permanent school-supplied space is necessary. A second mobile unit is available on which the manipulative devices accompanying the program are organized.

A color coding system, whereby each of the ten topics is printed might look something like this when placed on the IMS continuum:

I M S	I	II	III	IV	V	VI	VII	VIII	IX	X
NUMERATION	X	X	X	X						
ADDITION	X	X	X	X	X					
SUBTRACTION	X	X	X	X						
MULTIPLICATION	X	X	X							
DIVISION	X	X								
FRACTIONS	X	X	X							
MIXED OPERATIONS	X	X	X							
MONEY	X	X	X	X	X					
TIME	X	X	X							
SYSTEMS OF MEASUREMENT	X	X	X							
GEOMETRY	X									
SETS & LOGIC	X	X	X							

The teacher's procedure is as follows: to select the area in which there is the greatest lag, and then give the student a pretest in this area to decide what skills he needs to work on most. The results of this test are used by the teacher to write a lesson plan, or prescription, which indicates the IMS materials that seem most suitable for helping that particular child to master those particular skills. The child has now entered the IMS continuum.

When a pupil feels he is ready to move on, which might be before he completes all of the pages his teacher has assigned, he takes a short check-up test on that skill. IMS provides two such check-ups for each skill. If the test shows he has really mastered that skill, he may indeed move on, going to work in another skill in that unit in which he has shown some weakness.

Eventually, when he has mastered all of the skills for a unit, he will take the unit post-test. If he shows mastery here, he is ready on a different color of paper, also simplifies the filing and location of materials. Thus, work pages in fractions, all skills in all units at all levels, are yellow; in nemeration, all skills in all units at all levels are pink; in subtraction, all skills in all units at all levels are blue; and so on. This system has an advantage for individualization in the classroom as well: the color of a child's work pages can only identify the kind of work he is doing, not the level at which he is doing it. His own individual pace remains exactly that--his own.

Another unique feature of IMS is that each separate page is laminated and students write on them with a nylon-tipped pen which makes marks that can be removed easily. The pages, therefore, are not only durable but reusable, a distinct advantage for the public school budgets with which teachers are already so familiar. The IMS pages also are strikingly attractive and this in itself, wholly apart from their mathematical interest, has much to offer in terms of pupil motivation. Elementary school children will move through them with keen anticipation and delight, if only to see what pictures and colors will turn up next!

How does it work?

With its series of small steps toward the accomplishment of specific objectives, IMS is an uninterrupted sequence, or continuum, into which a child can enter at any point.

How is this point determined? By the results of a placement test which gives an overall picture of his strengths and weaknesses in the skills of that level. His profile, as the results are called, part of the program, and how to interpret their results in terms of appropriate individual lesson plans. They must appreciate the varying paces and learning styles of children and be ready to assist each one at whatever level he may be working. In short, the teacher is an essential element of IMS. While the materials will do much of what teachers did before, now they are freed to use their skills where they will make the most impact: in responding to the individual needs of children. No system can foresee every problem or offer every solution. The teacher is needed to react, to integrate, to understand, to put the materials to work for students. In this spirit, the IMS program is a challenge and responsibility requiring every bit of the flexibility and creativity that good teachers have always brought into their classrooms.

Electronic Learning, Inc.

Mathematics Program

I. Description of Tapes as Instructional Devices

A. Audio-tape (in cassette form) with same lesson on each side, making rewinding unnecessary at the end of each lesson

B. Corollary Work-Study Guide for students' participation in lesson - use of illustrations and diagrams, as well as examples to aid in learning

C. Lessons vary in length from 8 to 27 minutes, depending upon maturity of student and complexity of lesson

D. Taped lessons are additional teaching medium for the meeting of individual needs in a classroom
   1. Review and reinforcement for the child having difficulty learning a skill or concept
   2. Enrichment for the advanced math student.
   3. Make-up lessons for absentees

E. Taped lessons should be only one part of a well-rounded curriculum involving
   1. Group lessons and discussions
   2. Manipulative material
   3. Individual teacher-student meetings

F. Lessons are listed within each unit from simple to increasing levels of difficulty
   1. Three categories
      a. Primary
      b. Intermediate
      c. Advanced
   2. Specific grade levels not indicated since individual needs will vary within any given grade
   3. Starred lessons indicate those for enrichment

G. Teaching procedure provides for understanding -- written and produced by experienced teachers - presently engaged in the teaching of mathematics
   1. Discovery techniques
   2. The showing of relationship of new ideas to those already learned
   3. Diagrams and illustrations -- which precede the algorism in most cases
   4. Portrayal of mathematics as an integral part of life - utilization of life situations

H. Teacher's role
   1. Diagnostician --- provides the necessary lesson
   2. Evaluator of students' rates of progress
   3. Advisor on students' sequential steps in learning for effective use of taped lessons

I. Develops skill in listening and following directions

J. Lessons are pre-tested and quality-controlled by children of all abilities -- ranging from the slow learner to the gifted

II. Types of Classroom Organization

A. Individualized use of tape -- provides the ideal teacher-student ratio
   1. Student proceeds at own rate
   2. Student uses self-evaluative techniques in privacy

B. Small Groups - Children with similar skill and concept needs

C. Whole group instruction -- frees teacher to closely observe the students as they work, and give additional help as needs arise
   1. Initiating a unit
   2. Reviewing a unit
   3. Reinforcing a difficult topic

ELECTRONIC LEARNING INC.
A SOUND METHOD OF INDIVIDUALIZED LEARNING

50 Glen Street
Glen Cove, New York 1
516 671-9440

MATHEMATICS UNITS

I. Number & Numeration - 15 Lessons

	Catalogue No.
1. Place Value - Ones Group	NN01
2. Place Value - Thousands Group	NN02
1. Reading & Writing Large Numbers - Lesson 1	NN03
2. Reading & Writing Large Numbers - Lesson 2	NN04
1. Rounding to the Nearest Ten	NN05
2. Rounding to the Nearest Hundred	NN06
3. Rounding to the Nearest Thousand	NN07
4. Rounding Numbers - The Changing Nines	NN08
5. Using Rounded or Estimated Numbers	NN09
** 1. Exponents - Power of the Factor	NN10
** 2. Powers of Ten	NN11
** 3. Expanded Notation	NN12
** 1. Prime and Composite Numbers	NN13
** 2. Finding Prime Factors	NN14
** 3. Prime Factors Using Exponents	NN15

II. Introduction to Fraction Concepts - 8 Lessons

1. Fractions as Parts of a Whole - Lesson 1	FC01
2. Fractions as Parts of a Whole - Lesson 2	FC02
3. Fractions as Parts of a Group or Set	FC03
4. Understanding Equivalent Fractions	FC04
5. Renaming Proper Fractions - Higher and Lower Terms	FC05
6. Renaming Proper Fractions - Lowest Terms	FC06
7. Renaming Improper Fractions - Expanded Method	FC07
8. Renaming Improper Fractions - Division Method	FC08

** Enrichment Lessons

PROJECTED UNITS

III. Mathematical Operations with Fractions - 15 Lessons

1. Addition and Subtraction of Like Fractions - (no renaming)
2. Finding Least Common Denominator - Inspection & Multiples Meth.
3. Addition and Subtraction of Unlike Fractions - Using L.C.D. (no regrouping)
4. Subtraction of Like and Unlike Fractions - Regrouping & Review Test.

5&6. Multiplication of Fractions - Understanding the Process
7. Multiplication of Fractions - By Fractions, Whole, & Mixed Numbers
8. Multiplication of Whole and Mixed Numbers - Horizontal Method
9. Multiplication of Whole and Mixed Numbers - Vertical Method & Review Test
10. Division of Fractions - Understanding the Process
11. Division of Fractions - Divisible Method
12. Division of Fractions - What is a Reciprocal?
13. Division of Fractions - Understanding the Reciprocal Property
14. Division of Fractions - Using the Reciprocal Property & Review Test

** 15. Multiplication and Division of Fractions - Using Least Common Denominators

IV. Modern Math - 25 Possible Lessons

Numbers of lessons approximate. It is possible that one lesson will be expanded into two, or that two lessons can be combined into one, or that lessons will be added.

A. Sets
1. Recognition of Sets
2. Size and Element - (Finite, Infinite - Equivalent)
3. Subsets and Venn Diagrams
4. Disjoint and Universal Sets
5. Application of the Properties or Laws to the Operation with Sets.

B. Mathematical Principles
1. Closure Principle in Addition and Multiplication
2. One the Identity - Zero as a Factor
3. Commutative Property - Addition and Multiplication
4. Associative Property - Addition and Multiplication
5. Distributive Property.

C. The Number Line in Mathematical Operations
   1. Positive and Negative Numbers - Addition
   2. Positive and Negative Numbers - Multiplication
   3. Positive and Negative Numbers - Subtraction
   4. Numbers by Different Names - (Decimals, Fractions)

D. Number Patterns
   1. Squared Numbers
   2. Unit Fractions
   3. Reciprocals
   4. Rational Numbers

E. Ordered Pairs
   1. Properties of Ordered Pairs
   2. Fractions as Ordered Pairs

F. Numeration with Bases Other than 10.
   1. Base 5 (The Quinary System)
   2. Base 12 (The Duodecimal System)
   3. Base 2 (The Binary System)

V. Number Sentences - Tentative Lessons - Number Approximate

1. Equality and Inequality
2. Operational Symbols as Placeholders - Letter n
3. Families of Facts - Addition and Subtraction
4. Families of Facts - Multiplication and Division
5. Greater Than, Less Than, Equal To
6. Using Variables

VI. Problem Solving - Equation Approach (Grades 3 - 7)
Tentative Lessons - Number Approximate

1. How to Read a Mathematical Problem - Addition & Subtraction
2. How to Read a Mathematical Problem - Multiplication & Div.
3. Using Equations to Solve Problems - Addition and Subtraction
4. Using Equations to Solve Problems - Multiplication & Div.
5. Using Equations to Solve Problems - Two-Step Problems
** 6. Using Equations to Solve Problems - Three-Step Problems
** 7. Using Equations to Solve Problems - Involving Extra and Missing Information

Lessons are listed in increasing order of difficulty within each unit.

** Enrichment lessons.

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MATHEMATICS PRICE LIST

PER UNIT -- (INCLUDES SPIRIT MASTER WORK-STUDY GUIDES)

UNIT #1 - (15 LESSONS PLUS ONE TEACHER'S MANUAL CASSETTE)	$168.40
UNIT #2 - (8 LESSONS PLUS ONE TEACHER'S MANUAL CASSETTE)	$ 90.45
UNIT #3 - (15 LESSONS AVAILABLE AFTER FEBRUARY 1970)	
INDIVIDUAL LESSONS IN MODERN MATH UNIT AVAILABLE AFTER MARCH 1970	

ADDITIONAL UNITS -- (WITHOUT SPIRIT MASTER WORK-STUDY GUIDE)

UNIT #1 - (15 LESSONS PLUS ONE TEACHER'S MANUAL CASSETTE)	$127.50
UNIT #2 - (8 LESSONS PLUS ONE TEACHER'S MANUAL CASSETTE)	$ 68.00
INDIVIDUAL LESSONS - WITHOUT WORK-STUDY GUIDE	$ 8.95

TAPE DUPLICATING RIGHTS -- $2.00 PER TAPE

WORK-STUDY GUIDES

SPIRIT MASTER SETS INCLUDED IN UNIT PRICE

PRINTED SETS AVAILABLE:

28¢ PER SET... $12.50 - LOTS OF 50 OF THE SAME SET.

EQUIPMENT

CASSETTE TAPE RECORDER/PLAYER..........$32.50

CASSETTE PLAYER ONLY...................$21.45

TERMS ------ NET 30 DAYS

F.O.B. - GLEN COVE, NEW YORK

MAJOR CHARACTERISTICS OF NEW ELEME

GUIDE TO MAJOR CHARACTERISTICS	CONCEPTUALLY ORIENTED PROGRAMS IN ELEMENTARY SCIENCE (COPES)	ELEMENTARY SCIENCE STUDY (ESS)	INQUIRY DEVELOPMENT
GRADE LEVEL: Projected grade levels are shown. There is no substantial evidence that the programs work better for one student population than another. Most of the programs were field tested with students of wide-ranging abilities. Analysis suggests the programs are superior to a textbook for slow learners because few reading materials are used and the laboratory approach should interest non-readers.	K-6	K-8	4-9
SUBJECT AREA: How each program balances the traditional areas of science --physical, biological, etc.--has not been analyzed. Most of the programs cover "general science," but lean toward physical science. Few provide much earth or space science. One program integrates mathematics with science, but all include math to some extent. Most of the programs can be related to other subjects, such as language, music and art.	GENERAL SCIENCE	GENERAL SCIENCE	PHYSICAL SCI
SUGGESTED USE: Some of the programs can be used as supplementary material; others should be used as complete programs. In deciding, weigh the advantages of a program tailored to a school's requirements against the advantages of materials designed and tested as a comprehensive program. The recommendations in the chart are based upon three factors discussed elsewhere in the chart: (a) the degree to which goals and outcomes are defined by the developer; (b) the type of unit sequencing; and (c) the degree to which the teaching strategies are prescribed.	COMPLETE PROGRAM	SUPPLEMENTARY OR COMPLETE PROGRAM	SUPPLEMENTARY OR CO YEAR PROGRAM
TEACHER MATERIALS: All programs provide teacher's guides suggesting lesson plans and classroom activities. Some provide additional resource material.	TEACHER'S GUIDES	TEACHER'S GUIDES	TEACHER'S GUIDE, AND READER
STUDENT MATERIALS: All programs require extensive student materials; all but one provide most of them. Reading is minimized throughout since the programs are laboratory oriented.	LAB MATERIALS SPECIFIED BUT NOT PROVIDED; OCCASIONAL WORKSHEETS	LAB MATERIALS FOR EACH STUDENT; OCCASIONAL WORKSHEETS, A FEW SUPPLEMENTARY READERS	LAB MATERIALS FOR DENTS; IDEA BOOKS, AND RESPONSE BOOKLET
GOALS: A significant trend reflected in all the programs is a shift from teaching the specific facts and theories that are the products of scientific investigation to the investigation itself. These programs emphasize the need for students to learn through experience such general scientific processes as observing, questioning, building and testing hypotheses. They also provide students with concepts that organize an ever-increasing number of facts and changing theories. Although they differ in the emphasis they give to processes and concepts, no program takes the position that one can be taught without the other.	DEVELOP "SCIENTIFIC LITERACY" THROUGH FUNCTIONAL UNDERSTANDING OF "MAJOR CONCEPTUAL SCHEMES"	GOALS INTENTIONALLY NOT SPECIFIED; MATERIALS AND ACTIVITIES FOR A "SCIENCE EXPERIENCE" THAT WILL LEAD STUDENTS AND TEACHERS TO SET THEIR OWN GOALS ARE PROVIDED	DEVELOP INQUIRY SKILLS BASIC PROCESS OR MEANS IN SCIENCE
SAMPLE TOPICS: Although all of the programs intend to teach science processes and concepts, they differ in the content selected as the focus for each unit or activity. The chart lists sample topics from each program.	CONSERVATION OF ENERGY, INTERACTION AND CHANGE, THE STATISTICAL VIEW OF NATURE, STRUCTURAL UNITS OF THE UNIVERSE	SEEDS, MYSTERY POWDERS, PENDULUMS, BONES, BATTERIES AND BULBS, MEALWORMS, GASES AND AIRS, KITCHEN PHYSICS	NEWTON'S LAWS OF MOTI FRICTION, CENTRIFUGAL SERVATION OF MOMENTUM CHANGES OF STATE
STUDENT EVALUATION: Some developers state lesson or unit objectives as observable student performance; such objectives are called behavioral objectives. Some programs specifying behavioral objectives provide tests and some do not. Other programs do not specify behavioral objectives but do provide enough information to enable the teacher to develop appropriate tests. Some developers object to a heavy emphasis on specific objectives either because they believe current techniques are inadequate or because they believe the teachers and students should be free to set their objectives. These developers place heavy emphasis on teacher observation and judgment for evaluation.	TESTS PROVIDED; SPECIFYING CONCEPTS TO BE LEARNED	NO TESTS; RELIANCE ON STUDENT AND TEACHER JUDGMENT	SOME EVALUATION PROVID HEAVY RELIANCE ON TEAC
UNIT SEQUENCING: Some programs are sequenced so that success in one unit depends upon success in a preceding one. Others are designed so that any unit can be used independently. An advantage of sequencing is the "building block" effect; complex skills develop from skills previously mastered. Another advantage is that a prescribed sequence also relieves the teacher of planning the order of lessons. The disadvantages include less freedom for the teacher and the difficulties encountered with late-entering students.	STRUCTURED SEQUENCE	INDEPENDENT UNITS	INDEPENDENT UNIT
INSTRUCTIONAL STRATEGY: All programs provide lesson plans and general procedures for handling activities. Some provide an explicit, uniform methodology of instruction. In some cases the methodology is a sequence of specific activities; in other cases, it is a general role or posture the teacher assumes throughout. Where provided, these uniform methodologies should be followed to insure maximum success. None of the procedures are so rigid that they are inflexible; all programs require competent, creative teachers.	NO PREDOMINANT TEACHER ROLE PRESCRIBED. INSTRUCTIONS FOR EACH ACTIVITY GIVEN. TEACHER DIRECTS ATTENTION TO CONCEPTS.	NO SEQUENTIAL PROCEDURES; STRONG EMPHASIS ON NON-DIRECTIVE APPROACH AND STUDENT INITIATED ACTIVITIES AND EXPLORATION.	A SEQUENTIAL PATTERN: PUZZLING PHENOMENA; ELIC THEORIES; TEST THEORIES. PROVIDES NO "RIGHT" ANS STUDENTS MUST BE FREE T
TEACHER PREREQUISITES: Teacher requirements fall into two categories: (1) amount of science background needed to teach the program; (2) the need for specific training in the style or role to be followed during instruction. Inservice or preservice training is highly desirable where there is an explicit, uniform instructional strategy. Inservice training can be negotiated with some of the publishers. In general, the projects do not provide such training. Some teacher-training can be obtained through universities or summer institutes.	STRONG SCIENCE BACKGROUND NEEDED; NO SPECIAL TRAINING IN METHOD NEEDED.	NO SPECIALIZED SCIENCE TRAINING NEEDED; ABILITY TO BE NON-DIRECTIVE HIGHLY DESIRABLE.	MODERATE PHYSICAL SCIE GROUND DESIRABLE; ABIL FOLLOW PRESCRIBED "INQ APPROACH ESSENTIAL.
DEVELOPMENTAL AGENCY AND CURRENT PROJECT DIRECTOR (SUMMER 1970): Groups of professionals, rather than individuals, developed most of the programs. Most had Federal support. All programs went through repeated cycles of writing, tryout, or field testing, and revision before release.	NEW YORK UNIVERSITY; MORRIS H. SHAMOS	EDUCATION DEVELOPMENT CENTER; FRANK WATSON	SCIENCE RESEARCH ASSO RICHARD SUCHMAN
COST (SUMMER 1970): Costs shown are approximate; they were computed on a base of 30 students per year over a three-year-use cycle and include initial price plus replacement supplies. Teacher training costs are not included. A cost shown as "variable" was not computed because any number of units may be used. Cost can be reduced by use in more than one class per year.	AVAILABLE FROM DEVELOPERS	VARIABLE	$6-7 OR VARIAB
AVAILABILITY (FALL 1970): Principal publishing and supply agents are listed with availability of materials. Alternative sources for [illegible] materials are given in the complete Information Unit.	ONE SEQUENCE (CONSERVATION OF ENERGY) ONLY—COPES; NEW YORK UNIVERSITY	54 UNITS; McGRAW-HILL	ALL UNITS; SCIENCE ASSOCIATES

S OF NEW ELEMENTARY SCIENCE PROGRAMS.

ELEMENTARY SCIENCE STUDY (ESS)	INQUIRY DEVELOPMENT PROGRAM (IDP)	MINNESOTA MATHEMATICS AND SCIENCE TEACHING PROJECT (MINNEMAST)	SCIENCE--A PROCESS APPROACH (S-APA)	SCIENCE CURRICULUM IMPROVEMENT STUDY (SCIS)
K-8	4-9	K-3	K-6	K-6
GENERAL SCIENCE	PHYSICAL SCIENCE	GENERAL MATH AND SCIENCE	GENERAL SCIENCE	PHYSICAL AND LIFE SCIENCE
SUPPLEMENTARY OR COMPLETE PROGRAM	SUPPLEMENTARY OR COMPLETE ONE-YEAR PROGRAM	COMPLETE PROGRAM	COMPLETE PROGRAM	COMPLETE PROGRAM
TEACHER'S GUIDES	TEACHER'S GUIDE, AND A BACKGROUND READER	TEACHER'S GUIDES AND A RESOURCE HANDBOOK	TEACHER'S GUIDES AND A BACKGROUND READER	TEACHER'S GUIDES
LAB MATERIALS FOR EACH STUDENT; OCCASIONAL WORKSHEETS, A FEW SUPPLEMENTARY READERS	LAB MATERIALS FOR PAIRS OF STUDENTS; IDEA BOOKS, RESOURCE BOOKS AND RESPONSE BOOKLET	LAB MATERIALS FOR EACH STUDENT; WORKBOOKS	LAB MATERIALS FOR EACH STUDENT	LAB MATERIALS FOR EACH STUDENT; STUDENT WORKBOOKS
GOALS INTENTIONALLY NOT SPECIFIED; MATERIALS AND ACTIVITIES FOR A "SCIENCE EXPERIENCE" THAT WILL LEAD STUDENTS AND TEACHERS TO SET THEIR OWN GOALS ARE PROVIDED	DEVELOP INQUIRY SKILLS AS THE BASIC PROCESS OR MEANS OF LEARNING IN SCIENCE	DEVELOP "INTELLECTUAL TOOLS" (CONCEPTS) AND "OPERATIONS" (PROCESSES) OF SCIENTIFIC INVESTIGATION	DEVELOP SKILLS THAT LEAD TO MASTERY OF BASIC SCIENTIFIC PROCESSES	DEVELOP "SCIENTIFIC LITERACY" THROUGH FUNCTIONAL UNDERSTANDING OF BASIC SCIENTIFIC "CONCEPTS"
SEEDS, MYSTERY POWDERS, PENDULUMS, BONES, BATTERIES AND BULBS, MEALWORMS, GASES AND AIRS, KITCHEN PHYSICS	NEWTON'S LAWS OF MOTION, VECTORS, FRICTION, CENTRIFUGAL FORCE, CONSERVATION OF MOMENTUM, GASES, CHANGES OF STATE	NUMERATION, OBSERVING PROPERTIES, SYMMETRICAL PATTERNS, INVESTIGATING SYSTEMS, SCALING AND REPRESENTATION, COMPARING CHANGES, PARTS AND PIECES	OBSERVING, MEASURING, USING SPACE-TIME RELATIONSHIPS, PREDICTING, INFERRING, FORMULATING HYPOTHESES, INTERPRETING DATA, CONTROLLING VARIABLES, EXPERIMENTING	INTERACTION AND SYSTEMS, ORGANISMS, RELATIVE POSITION AND MOTION, LIFE CYCLES, ENERGY SOURCES, POPULATIONS, ECOSYSTEMS
NO TESTS; RELIANCE ON STUDENT AND TEACHER JUDGMENT	SOME EVALUATION PROVIDED; BUT HEAVY RELIANCE ON TEACHER JUDGMENT	NO TESTS; BEHAVIORAL OBJECTIVES ARE INFERRABLE	TESTS PROVIDED; BEHAVIORAL OBJECTIVES GIVEN	NO TESTS; SOME PROCEDURES SUGGESTED OR INFERRABLE
INDEPENDENT UNITS	INDEPENDENT UNITS	STRUCTURED SEQUENCE	"HIERARCHICALLY" STRUCTURED SEQUENCE	STRUCTURED SEQUENCE
NO SEQUENTIAL PROCEDURES; STRONG EMPHASIS ON NON-DIRECTIVE APPROACH AND STUDENT INITIATED ACTIVITIES AND EXPLORATION.	A SEQUENTIAL PATTERN: INTRODUCE PUZZLING PHENOMENA; ELICIT THEORIES; TEST THEORIES. TEACHER PROVIDES NO "RIGHT" ANSWERS; STUDENTS MUST BE FREE TO INQUIRE.	NO PREDOMINANT SEQUENTIAL PATTERN; NO PREDOMINANT TEACHER ROLE PRESCRIBED.	A SEQUENTIAL PATTERN OF ACTIVITIES CONCLUDING WITH TESTING OF PERFORMANCE; NO PREDOMINANT ROLE FOR TEACHER.	A SEQUENTIAL PATTERN: ENCOURAGE EXPLORATION OF MATERIALS; INTRODUCE AN ORGANIZING CONCEPT; ENCOURAGE TRANSFER AND APPLICATION OF CONCEPT. TEACHER ROLE SHIFTS AT EACH PHASE: DIRECTIVE WHEN CONCEPT INTRODUCED; NON-DIRECTIVE ELSEWHERE.
NO SPECIALIZED SCIENCE TRAINING NEEDED; ABILITY TO BE NON-DIRECTIVE HIGHLY DESIRABLE.	MODERATE PHYSICAL SCIENCE BACKGROUND DESIRABLE; ABILITY TO FOLLOW PRESCRIBED "INQUIRY" APPROACH ESSENTIAL.	NO SPECIALIZED SCIENCE TRAINING NEEDED; NO SPECIALIZED TRAINING IN METHODOLOGY NEEDED.	NO SPECIALIZED SCIENCE TRAINING NEEDED; TRAINING IN BEHAVIORISTIC APPROACH OF PROGRAM DESIRABLE; AN INSERVICE COURSE AVAILABLE	NO SPECIALIZED SCIENCE TRAINING NEEDED; TRAINING IN SPECIFIC INSTRUCTIONAL STRATEGY OF PROGRAM DESIRABLE.
EDUCATION DEVELOPMENT CENTER; FRANK WATSON	SCIENCE RESEARCH ASSOCIATES; RICHARD SUCHMAN	MINNESOTA MATHEMATICS AND SCIENCE TEACHING PROJECT; JAMES WERNTZ	COMMISSION ON SCIENCE EDUCATION OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE; JOHN MAYOR	SCIENCE CURRICULUM IMPROVEMENT STUDY; ROBERT KARPLUS
VARIABLE	$6-7 OR VARIABLE	$14-16 (MATH AND SCIENCE)	$4-5	$4-5
54 UNITS; McGRAW-HILL	ALL UNITS: SCIENCE RESEARCH ASSOCIATES	ALL UNI[illegible] MATHEMATICS AND S[illegible] PROJECT; [illegible] OF SCIENCE AND [illegible] UDY COMPANY	ALL UNITS: XEROX	GRADES 1-3 COMPLETE; K AND GRADES 4-6 UNDER DEVELOPMENT; RAND-MCNALLY PUBLISHING COMPANY

Use of the Information Unit

As a Decision Making Tool

By a curriculum decision-making committee (administrators, teachers, parents, students)

By a school board, panel, or parents' committee reviewing or being informed of a curriculum adoption recommendation.

As as Information Resource

By in-service groups learning about new trends and programs.

By undergraduate and pre-service methods classes.

By concerned community, parent, teacher and student groups.

Programs Described in the Elementary science education, in sharp contrast to traditional text-oriented approaches:

They involve students in basic science processes and concepts -- rather than teaching facts, laws and theories.

They create a laboratory environment by using action-materials and exercises rather than reading matter.

All believe children capable of advanced levels of science; all encourage children to experiment and inquire rather than just observe and listen.

Conceptually Oriented Program in Elementary Science -- COPES

General science program focusing on five conceptual schemes. K-6 sequence designed to develop skills and functional understanding of science. Lab oriented; no materials provided. New York University.

Elementary Science Study -- ESS

General Science program focused on non-directed, free exploration of carefully selected natural phenomenon. Units are used as complete K-8 program or as supplements. Education Development Center

The Elementary Science Information Unit
of the
Far West Laboratory for Educational Research and Development

The Information Unit Contains

Introduction and Directions: A printed booklet introducing the unit and its use; intended for the group leader. Text of all audiovisual presentations included.

Brochure: An introductory handout for individuals which explains the Unit. Contains charts and summaries of all programs reviewed.

Audiovisual Preface: 15-minute audiovisual overview of all the programs, intended particularly for groups. Also describes group use of the complete Information Unit.

Reports: Detailed information about the goals, content, materials, classroom activities, costs, evaluation and other major features of each program.

Supplement: Regularly updated sheet describing those aspects of the program which change frequently -- costs, stage of development, names of field test schools, etc.

To Secure the Elementary Science Unit

Contact:
Educational Products Information Exchange
386 Park Avenue South
New York, New York 10016

EPIE will distribute the unit in late Spring, 1970. The unit may either be purchased or rented.

Future Information Units

Information units describing innovative individualized instruction programs and secondary social studies programs for the study of American government are presently being developed. Should you be interested in field testing one of these packages or securing the final versions which will be available late in 1970, contact:

Dr. C. L. Hutchins
Far West Laboratory for Educational
Research and Development
1 Garden Circle, Hotel Claremont
Berkeley, California 94705

Inquiry Development Program -- IDP

Physical science problems focused on inquiry process. Teacher assumes non-directive role to encourage thinking. One full-year sequence or supplementary units. Grades 4-6. Science Research Associates

Minnesota Mathematics and Science Teaching Project -- MINNEMAST

Combines math and science processes and concepts in spiral program for grades K-3. Structured activities leading students to observe and experiment. Minnesota Mathematics and Science Teaching Project

Science - A Process Approach -- S-APA

General science program developing skills in science processes. Sequential program, K-6. Behavioral objectives specified. Commission on Science Education, American Association for the Advancement of Science

Science Curriculum Improvement Study -- SCIS

Physical and life science program for K-6. Focuses on concept development. Units follow structured sequence. A specially designed teaching procedure is used. University of California

EXCERPTS FROM "INDIVIDUALLY MANAGED LEARNING"
by Robert A. Weisgerber and Harold F. Rahmlow --
Audiovisual Instruction, October 1968, pp. 835-839.

At the American Institutes for Research in Palo Alto, California, Project PLAN is a part of the Institute for Individual Educational Development, a nucleus of research and support personnel who are engaged in a comprehensive attack on the complex problem of individualizing learning. The initial effort focuses upon the four disciplines of science, language arts, mathematics, and social studies in all twelve grades. The general schedule of this project is as follows:

Grades	Learning and Evaluation System Developed by	First Field Test and Revision	Second Field Test and Update	National Demonstration
1-5-9	September 1967	1967-1968	1968-1969	1969-1970
2-6-10	September 1968	1968-1969	1969-1970	1970-1971
3-7-11	September 1969	1969-1970	1970-1971	1971-1972
4-8-12	September 1970	1970-1971	1971-1972	1972-1973

Participating students will have continuity of learning using the PLAN materials; for example, the student who finishes grade 1 will move to grade 2 at the same time the draft learning units become available. Developmental effort is, therefore, progressing simultaneously in different kinds of school environments and with varying levels of maturity in the population. Altogether, 14 school districts have participated in the first year and a half of the Project. These districts are located in California, Pennsylvania, West Virginia, New York, and Massachusetts.

Students in Project PLAN pursue individual programs of study utilizing specially designed Teaching-Learning Units (TLU's). TLU's reference specific sections or parts of currently available instructional materials which will facilitate youngsters' accomplishment of particular objectives.

Each of these TLU's is an approximately two-week increment or module of the particular subject domain with many internal steps, so it is possible for a student to shift flexibly among the TLU's which he has been assigned in the four disciplines. This enables variety, concentration of attention where needed, and a balance in his progress through the school year. The student reports his progress by a data card; and when he is ready, he is evaluated on his attainment of the objectives. For all students, progress and evaluation "tests" are fed from the school via telephone lines to a high-speed digital computer, where the tests are scored and printouts are provided back to the school the following day. Their progress becomes a part of the computer's data file and this, when taken together with the existing background file on each student, becomes a basis for selecting alternative TLU's which each student might then appropriately undertake.

A central element of the PLAN project is the instructional material and equipment with which the student interacts. Various kinds of books are used, and an array of audiovisual equipment and new media are specified, including tapes, records, filmstrips, maps, slides, study prints, motion pictures, flannel boards, and so on. A number of farsighted publishers are actively collaborating, including McGraw-Hill, Houghton Mifflin, Chandler, Addison Wesley, American Book, S.R.A. and others.

This is in line with a major Project goal: that individualized instruction can be accomplished by improved techniques rather than by greatly escalated costs. Technology will continue to be introduced in modest increments as a way of determining how media can be most effectively introduced without greatly adding to the cost burden in schools that might adopt the system.

Following the outline of a curriculum, a "scope and sequence" is developed which lists available topics within the project. Experienced teachers from the participating school districts use the curriculum document and the tentative scope and sequence to develop behavioral objectives around which programs for individual students can be formed.

When behavioral objectives are set, learning activities are specified to use a variety of currently available instructional materials. In the past, schools have not had a comprehensive set of instructional objectives available, and as a consequence, it has been difficult, if not impossible, to assess adequately the value of learning materials. Therefore, Project PLAN is specifying behavioral objectives and then selecting materials to be used to help the students attain these objectives. In this manner, and with precoding of computer-stored data on student performance, it will be possible to evaluate the particular strength of many instructional materials as they assist students in attaining specific behavioral objectives.

Finally, evaluation measures are developed which are based upon the behavioral objectives. The results of these evaluations are then fed back to the student on an objective-by-objective basis so that it is possible for him and his teacher to determine specifically where the student's strengths and weaknesses lie.

Thus, it can be seen that the student in Project PLAN works within a broad curriculum framework on objectives which are specified and stated clearly for him. He uses materials selected to facilitate his learning, and he is evaluated and kept informed on whether or not he has achieved a particular objective. The entire system promotes realistic self appraisal as well as efficient and effective learning.

THE MATERIALS DISSEMINATION CENTER

The Materials Dissemination Center, an activity of the Institute for Development of Educational Activities, became operative as of July 1, 1966. The Center was conceived as a curriculum bank to serve teachers participating in the I/D/E/A Demonstration School Project and other teachers throughout the country.

The curriculum bank is a Center where teachers deposit and withdraw curriculum materials. These materials are specifically designed for individualization of instruction.

Teachers have contributed when they have materials accepted by a corps of consultants and have submitted the materials to the Materials Dissemination Center.

The following assumptions are basic to the operations of the Materials Dissemination Center:

I. That the Center will collect, disseminate, house, and evaluate materials, (UNIPACS). In addition, the personnel of the Center will motivate and counsel teachers to produce such materials at workshops, conferences and at individual schools.

II. That teachers will produce continuous progress curriculum materials with the assistance and consultation of learning psychologists, subject matter specialists, and curriculum programmers.

III. That teachers will be given the opportunity to demonstrate and evaluate the material in their classrooms.

IV. That teachers will produce the material specifically for self-instruction and independent study by students. The material will facilitate continuous progress for the learners.

V. That the material will be organized into a self-contained package or unit of instruction and titled a UNIPAC. The UNIPAC will contain the following ingredients:

   A. The idea: concept to be taught or learned.

   B. A change in the behavior of the learner. (instructional objectives)

   C. Diversified content that implements the material to be learned.

   D. Diversified methodology used by the instructor to motivate the learner and present the lesson.

   E. Independent study projects to facilitate depth, breadth, and quest.

WHAT IS A UNIPAC

"A UNIPAC is a self-contained set of teaching-learning materials designed to teach a single concept and structured for individual and independent use in a continuous progress school program."

HOW TO USE A UNIPAC

UNIPACS are designed to help students achieve at their own best learning rates. Whether one refers to this as individualized instruction, continuous progress, or as self-paced learning, the intent is clear: given UNIPACS, students will be able to achieve measurable performances under given conditions, at or above specified minimum levels, and at rates which are individually unique to each student.

When the student with the assistance of a teacher selects a particular UNIPAC in his sequential learning program, he takes a pre-test based on the behavioral objectives in that UNIPAC. If the pre-test results indicate that he is ready for the concepts or skills of the UNIPAC, he selects from suggested learning materials and activities in the UNIPAC those which fit his own unique learning style. Behavioral objectives, which are contained in his UNIPAC, guide him as he learns. When he feels that he has achieved one behavioral objective, he proceeds to the next one and again selects from suggested learning materials and activities.

When the student feels that he has achieved all of the behavioral objectives in his UNIPAC, he takes a self-test. If the self-test results indicate that he is ready for teacher evaluation, the student can request the post-test for his UNIPAC. Upon successful completion of the post-test, the student may proceed to his next UNIPAC or he may participate in quest activities. If the student elects to participate in quest, he defines a problem for in-depth or in-breadth study, and he conducts his research in order to achieve some level of resolution of his problem.

During the entire learning sequence the teacher provides as many opportunities as possible for student-teacher and student-student interaction during conferences and seminars. Small learning teams, made up of from two to six students are formed whenever feasible. The teacher monitors each student's progress, diagnoses learning problems, prescribes possible alternative learning materials and activities (usually suggested in the UNIPAC) which will help to solve the problems, and evaluates each student's progress in achieving stated behavioral objectives. As a result of individualizing instruction through UNIPACS, the teaching-learning act becomes much more personalized both for the teacher and for the student.

/I/D/E/A/
UNIPAC Program
12345 Westminster Boulevard
Santa Ana, California 92703

APPENDIX G

CASE STUDY

CASE STUDY

Name Rebecca Webster

Age: 4

Stage: I

Teacher: Mrs. Alice Glen

On September 16, Mrs. Glen observed a student, Rebecca Webster, for the first time formally. She watched Rebecca matching and grouping sets of symbols and objects. As Rebecca worked she attempted to identify the colors of the objects. Mrs. Glen referred to a checklist as she watched (see Figure 1). On it she noted areas requiring practice, and simply initialed areas where progress appeared normal. After watching for about ten minutes, Mrs. Glen identified some reading readiness skills that Rebecca needed to practice. In addition, she made a note for Rebecca to work on colors. She consulted the Fort Lincoln Objectives Book under Reading Objectives: Level A, Visual Discrimination (see Figure 2).

Mrs. Glen then went to the corresponding section of the Fort Lincoln Activities Book (see Figure 3) and looked under Reading: Level A, Visual Discrimination. She selected a number of activities for Rebecca which included paper and pencil activities, filmstrips, and games. The activities were designed to help Rebecca identify and name the colors, compare and match symbols, and discriminate likenesses and differences among objects and pictures of objects.

Among the materials were filmstrips dealing with proportion and size, with observing likenesses and differences in major and minor detail, and with identifying the colors. She also prescribed a sensorimotor game called Detect by

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* These pages are typical of those in the actual Activities Book.

SRA which uses the tachistoscope method of presentation for practice with visual discrimination among symbols and shapes. The paper and pencil activities included IPI worksheets and the SRA Red Book.

The teacher then entered these activities on a prescription sheet (see Figure 4). An aide was advised of the entry and asked to help Rebecca with her readiness activities. The aide assisted Rebecca with the visual presentation devices, gave the oral directions, observed and scored her work, and advised the teacher of problems along the way. She informed the teacher when Rebecca appeared ready for another formal observation.

Stage I Checklist
Unit 1. 00 Observing

All objectives on this checklist are required.

End Reg. Obs.	Skill	9/16											
✓	Sorts collection of miniatures of common objects into groups of same kind -- cars, airplanes, etc.	aY											
	Sorts pictures of common objects into groups of same kind -- people, tools, etc.	aY											
	Sorts silhouettes of common objects into groups of same kind. Practice	aY											
	Sorts stylized miniatures of common objects into groups of same kind. Practice	aY											
	Sorts stylized black and white drawings of common objects into groups of same kind. Practice	aY											
	Sorts highly impressionist drawings of common objects into groups of same kind. Practice	aY											
	After studying picture of an object briefly and then having it taken away, finds identical picture in group of dissimilar pictures.												
	After studying picture of an object briefly and then having it taken away, finds identical picture in group of similar pictures.												
	Tells from memory what happened in silent motion picture he has seen.												
	Tells story of what's happening by sequence of comic pictures on a page.												
	Arranges series of pictures from left to right to tell a story.												
	Sorts pictures by kind even though pictures show each object from a variety of different angles.												
	Identifies same object or shape in series of pictures even though object or shape is shown from different angles.												
	Given a set of pictures of an object from different angles along with a picture of a similar but different object, picks out one that is different.												
	Given a series of pictures of an object from different angles with a similar but different object shown in one picture in the series, picks out one that is different.												
	Finds objects hidden in camouflaged drawings												
	Finds animals hidden in nautral camouflage in photographs												

9/16 Rebecca needs work on colors

Figure 1

3-6

End Reg. Obs.	Skill												
	After observing a series of pictures that change from one to the next in a regular pattern, chooses from among several similar possibilities the correct picture to complete the series.												
	After studying a series of abstract designs that change from one to the next in a regular pattern, chooses from among several similar possibilities that correct design to complete the series.												
	In a drawing rendered in perspective, identifies objects that are the same even though they are in different sizes.												
	In a drawing rendered in perspective, identifies which objects are closest and which are farthest away.												
	In a drawing rendered in perspective, identifies which objects are really the biggest and which are really the smallest.												
	While looking at a picture, describes fine details observed, such as freckles on a boy's nose.												
	Interprets detail in pictures to draw conclusions about abstractions, such as what time of year the picture represents.												

READING

Level A

Vis. D.	Identifies similarities and differences in objects and pictures; identifies size differentials.
Vis. D.	Identifies and names letters of the alphabet. Identifies groups of letters that form words.
Vis. D.	Identifies names and matches the basic colors.
Aud. D.	Identifies familiar vocal and nonvocal sounds. Selects rhyming words as read by teacher or shown in pictures.
Lit. C.	Associates words and pictures that are related. Describes several characteristics of an object.
Lit. C.	Responds after two directions are stated orally.
Int. C.	Arranges pictures in a logical sequence and gives orally the story presented. Interprets a story orally.
Eval C.	Completes an unfinished picture and marks what is wrong with a given picture.
Lib. S.	Responds by pointing to "title" or "word" in or on a book. Tells a story orally from a picture book.
Rel. R.	Traces or copies numbers, letters, and figures using correct pencil position. Identifies left and right, top and bottom on a page.
Rel. R.	Classifies pictured objects into broad categories.

Level B

Aud. D.	Identifies words beginning with short a, f, m, p, t from pictures. Gives orally words that rhyme with a word presented orally.
Voc. D.	Responds orally to printed McGraw-Hill Primer and Book 1 words and first 100 words on Dolch list. Uses them in sentences.
Lit. C.	Follows simple printed directions.
Lit. C.	Recalls events of a story orally and locates answers to questions in the text. Completes sentences with correct word in writing.
Int. C.	Tells a story from a picture series and describes the mood of a story listened to. Predicts or explains the outcome.
Eval C.	Identifies irrelevant ideas in a picture series or a paragraph.
Lib. S.	Locates the title and the author on a book cover. Moves finger left to right under a sentence in a book.
Ref. S.	Arranges alphabet in sequence.
Ref. S.	Marks the picture that defines a given word.
Rel. R.	Begins sentences with capital letters and ends them with . or ?

Level C

Aud. D.	Names letter heard at beginning or end of any word given orally.
Str. A.	Identifies and writes root words, singular and plural forms of regular roots, and contractions.
Voc. D.	Identifies in print simple synonyms, antonyms, and rhyming words. Uses context clues to define words.
Lit. C.	Matches words that form an associative pair.

Figure 2

Activities

Level or Stage A Unit Visual Discrimination

Inter. Obj.	Source	Activity	Location	Remarks
①	IPI	Worksheets	II	
①	CENCO	Reading Readiness	II	Filmstrips 1,2,4,20,21
①	SRA	Detect	II	Game
1	SRA	The Red Book	II	Pgs. 5,11,16,23,31,
				38,41,54,62,68,73,77.
②	IPI	Worksheets	II	
②	SRA	The Red Book	II	Pgs. 56,70.
3	IPI	Worksheets	II	
3	CENCO	Reading Readiness	II	Filmstrip 3
3	SRA	The Red Book	II	Pgs. 6,27,37,48,57.
4	IPI	Worksheets	II	
4	CENCO	Reading Readiness	II	Filmstrips 1,2,4.
4	CENCO	Preprimer Reading	II	Filmstrips 1,2,3,4,5.
4	SRA	Detect	II	Game
5	IPI	Worksheets	II	
5	Sullivan	Readiness in Language Arts	II	
5	SRA	Detect	II	Game
5	Sullivan	Reading Readiness	II	Programmed
6	IPI	Worksheets	II	
7	IPI	Worksheets	II	
7	Sullivan	Reading Readiness	II	Programmed Bks. B-D
8	IPI	Worksheets	II	
8	Hammett	ABC Picture Board and	II	Game
		Speller		
⑨	IPI	Worksheets	II	
9	CENCO	Reading Readiness	II	Filmstrip 7
⑨	Milton-Bradley	Color Recog. Flannel Bd.	II	
⑨	CENCO	Color Wheel	II	
⑩	IPI	Worksheets	II	
10	Sullivan	Readiness in Lang. Arts	II	
⑩	Webster/McGraw	Colors and Their Names	II	Colors, Unit II, 8mm
				filmloop and activity bks.
11	IPI	Worksheets	II	
11	Knowledge Aid	Picture Dictionary	II	Pg. 3, "Color Names"
12	IPI	Worksheets	II	

Figure 3

Name Rebecca Webster Advisor Mrs Glen

Terminal Objective Child differs between objects and sizes of objects, capital and small letters. Identifies words. Names colors.

Level or Stage A

Unit Visual Discrimination

Unit Tests
(Hi-Lo Prof. Crit. ______)

		Pre 1	1	2	Post 3
Score					
	%				
	Date				

Assignments

Date Pres.	Pres. Init.	Activity	Page, Part	Inter. Obj.	Score	Sc's Init.	Remarks
9/17	a.y	IPI		1	90	PL	
		CENCO (f.s)	I 20,21,22	1			
9/17	a.y	DETECT		1			
		IPI		2			
		RED Book	pp. 56,70	2			
		IPI		9			
9/18	PL	Color Wheel		9			Knows red, yellow
		Colors and their Names (Filmloop)		10			
9/19	PL	Color Wheel		9			
9/19	a.y	Flannel Board		9			

Figure 4

APPENDIX H

COMPREHENSIVE DIAGNOSTIC CRITERION-REFERENCED ACHIEVEMENT TESTING

by Joseph Lipson

Comprehensive Diagnostic Criterion-Referenced Achievement Testing

by Joseph Lipson

Better testing instruments are needed to serve the student and the instructional process, and they should be put to better use. The availability of technology such as programmed instruction, information retrieval systems with hard-copy printout, cassette recorders, and a wide variety of other materials and activities require a testing system which will describe the characteristics of the student so that he will interact with appropriate materials and activities.

Importance of what the student does not know. Imagine the problem of children moving between schools in an increasingly mobile society. A student enters the school and he should begin to receive instruction. For this to be an effective process we need information. Can he answer questions in more than monosyllables? What arithmetic operations can he perform? What words have meanings different to him than to others? How well can he follow the logic of directions which are used in the school? How well can he work independently? How well can he work cooperatively? How well can he use reference and research techniques?

If the teacher and the system assume nonexistent knowledge and abilities, the student will fail without knowing exactly why. He may experience a sense of embarrassment and shame for lacking the assumed abilities which everyone around him seems to exercise so competently. He may then hesitate to ask questions or to offer a judgment, activities so important to the educative process. Rather than seek interaction and risk exposure of painful ignorance, he may try to outguess the teacher and the system.

Importance of what the student does know. It is also extremely important to know what the student does know. What a student knows and is interested in is the fabric and foundation which can and must be used to make new information meaningful to him.[1] An analogy is fruitful only when the basis of the analogy is familiar to the student.

Rather than focus on the student's weaknesses or strengths, the unique aspects of his knowledge can be made a source of pride and can be used as a foundation for further learning. Does he have a special hobby which can be related to instruction and classroom performance? Has he read deeply in a certain area of human history? Has he been places which make him an excellent first hand reporter to the rest of the class? Does his father do a kind of work which would be relevant and interesting to the class?

Does the student know a certain way of doing things which will interfere with learning new ways of doing things? Does the student already know important segments of what would normally be taught so that he will be bored and disruptive during the repeated instruction?

In addition, it is important to know the boundary of a student's knowledge.[2] The student must be challenged by problems and tasks which are at the boundary between what he knows and does not know. If the tasks are too easy or hopelessly beyond him, motivation falls off. In short, a system of individualized instruction needs a map of the student's knowledge, interests, and abilities.

Desire to know about oneself. If testing has not been made punishing through negative uses, it tends to be enjoyable. There seems to be in many of us an interest in mapping ourselves along various dimensions. Magazines and newspapers find various tests to be good copy. Recently self-tests have appeared on sale for 25¢ in travel terminals; apparently people will pay for the privilege of taking a test! Students are usually intensely interested in information about them -- their picture, their record, their mark upon the world.

Comprehensive. The test should be comprehensive so that no important areas are left out of the mapping process. The more thorough and wide-ranging the testing, the more confident will be the student of what he knows and what he doesn't know. This reassures the student at the same time that it informs all involved in the educational process. Parents, when they are involved, can gain the information they seek through profiles which can be easily drawn from the results of comprehensive tests.

Diagnostic. Items must be included which permit the assignment of specific instructional sequences, i.e., the pattern of responses to specific items must be a guide to instruction. This means that the exact nature of errors or difficulties with a certain subject or process must first be confirmed by the administration of particular test items. For example, a student makes errors in addition of multiple digit numbers: inspection of the items he misses shows that they contained numbers with zeros. More problems of this type should be given to the student to see if this is the area of difficulty.

Criterion-referenced. This condition means that the guide to selection or preparation of items should be the mapping of the subject and the kinds of errors and difficulties students have. For example, all easy problems essential to progress in a subject should be included in criterion-referenced tests since failure to perform well on an easy question is almost certain to imply difficulty at a later stage.

An easy item which is easily performed does not take much time and once mastered is disposed of. Since we are interested in prescribing for the individual, normative statistics become of secondary interest in this kind of a test. Weighing of answers for scoring or percentile or stanine ratings is not necessary since we are interested in the specific item responses and their implication for the education of the individual.

Achievement. The results of the test should represent achievement which, according to the standards of schools, can be accepted for course credit, for certification, and possibly for diplomas. More important, the tests should be so organized that the student has a sense of achievement, a sense of what he can do now that he could not do some time ago.

Practical Problems. How does one develop comprehensive tests in the face of problems of cost and time? Can one, in fact, strike a balance between testing time and learning time? Certainly, as one increases the amount of school time spent in testing, a point will be reached where further increase in testing will impede rather than enhance the learning process. This is an empirical question which has not yet been answered and which deserves study. My argument is simply that if tests are used for the purposes named above (and not for selection or normative grading), our system can benefit from a greatly increased attention to tests which map a student's learning.

Sequencing to minimize testing. Probability can be used to assist in the item sequencing for a student in order to minimize testing time. For example, if a student is being examined on his knowledge of the 500 most frequently used words in the English language, it may be that if he gets 20 consecutive randomly chosen words correct the chances are 100 to 1 that he will perform to criterion (to be defined for each task) on the remaining 480 words. Thus, the testing could then immediately move to the next level of difficulty. Conversely, if a student begins to perform poorly at a certain level, testing can probably be discontinued temporarily, or items of less difficulty selected. Testing rules of this kind have been used before and educators[3] are now applying scaling rules to various forms of academic tests.

Student options. An important consideration in comprehensive testing is to make the student feel that the tests are for him, that the information belongs to him, that no secret dossiers are being compiled, and that he can express his individuality and sense of autonomy through the tests.

Students could interact with the tests in many ways in addition to the few that I have thought of. (1) The student could indicate a certain number of questions which he feels are inadequately stated and for which he would write a short essay rather than employ multiple choice responses. (2) The student could indicate up to 10 percent of the questions as ones for which he believes that his answer may be different from the key answer and, again, explain his answer in a short written answer. Since reading the short answer responses would require extra adult time, the student would perhaps be required to pay for the required time through his efforts or through a fee paid to the reader system. Successful challenges should form an excellent basis for refining the tests. (3) The student should be permitted to have a reasonably large say in what test elements are taken when. Hardly ever should a student be forced to take a test and he should be permitted to request any test element to be administered. (4) The testing system could be structured to simulate games or academic competition for those who enjoy and respond to this.

Individually Prescribed Instruction (IPI) mathematics as an example. While mathematics is somewhat atypical in the sense that it can be organized and sequenced from (1) simple to complex, (2) easy to difficult, (3) beginning to terminal, the experience of people with the IPI system of mathematics and reading instruction gives encouragement to the notion that comprehensive tests have value to the student, the school, and parents. [4, 5, 6, 7, 8, 9]

The IPI mathematics curriculum for elementary school children has about 400 performance objectives. Each objective takes on the average of one or two days of school to complete. Each objective is the basis of criterion items ranging from counting aloud from one to ten up through beginning algebra. The criterion items are organized into (a) placement tests (b) pretests and posttests, and (c) curriculum-embedded tests. Thus, we have a fairly comprehensive set of perhaps two or three thousand items. The way in which this system places a student at the boundary between what he knows and what he does not know has been particularly impressive. The items are not always excellent from a test writing standpoint but they have served their purpose surprisingly well in view of the straightforward and hurried conditions under which they were generated.

On the basis of the IPI experience one can project an organized and sequenced set of a few hundred thousand items spanning traditional subject knowledge, psychomotor abilities, and various tests of ability to process information (e.g. logic, inference, prediction, etc.). The various areas would be tested on a priority basis so that high priority areas would be assessed frequently and low priority areas (e.g., musical history?) would be assessed less frequently unless a special demand arose.

Uses of the tests. In addition to use in diagnosis and educational prescription, I would like to suggest another important use of the test that would involve no explicit response. Once we have information about our development and knowledge in a certain area, it is important to keep the option of not doing anything. The information obtained through testing can be used as a way to follow the student's growth in the area under consideration. My hypothesis is that just knowledge of test results alone will generally result in significant growth. The student will have been sensitized to a dimension of knowledge and his position on the map of the subject. This may result in increased attention and effort in situations which would otherwise be ignored. In any case, the student may learn from many sources other than explicit assignments in a subject.

It may be useful to follow the growth of the student by testing in areas that he is not actively studying as well as those which he is studying. One reason for this is to develop and understand the interaction and transfer between formal instruction and spontaneous and self-selected learning.

Cheating. The IPI experience implies that diagnostic tests are not threatening and that since there is no permanent pay-off for cheating, little occurs. Test security should be of no concern. If the tests are truly comprehensive, it makes little difference how the responses are developed. If anyone wished a copy of all the test items, that person could be given a copy.

Computer. It seems obvious that the computer can be useful in storing and retrieving the large number of items needed in a comprehensive testing program.

Furthermore, a computer program can generate efficient and interesting search procedures for mapping the abilities of a student. For example, the computer can call up an item either completely at random or at random from a given subject area (e.g. geography). If the student answers the question correctly the student can explore around the initial question by being asked related questions of approximately the same degree of difficulty and complexity. If the student answers the first question incorrectly, the program might present a second question either at a less difficult level or at the same level for reliability. The student at any time could enter the game by saying that he wants another question like the one he missed, that he wishes to have additional questions in an area that the computer is prepared to move away from, or that he wishes to move to another area regardless of his performance.

The computer could maintain a record of latency (the time student takes to answer), error count, and/or verbatim response item by item. On some schedule the computer could reintroduce questions that the student had encountered before in order to test retention growth and the chance that the student was merely lucky or unlucky the first time.

The computer tests need not be all multiple choice, pencil and paper items.[10] The student can be sent away from the terminal to do a laboratory problem and to enter his answer before he is shown the multiple choices necessary for easy scoring. If a typewriter input is used, a fair variety of constructed student responses can be handled as well as a complaint made when the student feels that the answer he gave is better than the ones in storage or when he feels that the question was faulty.

Summary. The suggestion outlined above is not especially original, nor does it involve skills or technology not currently available. Comprehensive diagnostic criterion-referenced achievement tests can, therefore, be constructed to make an important contribution to education within a relatively short time. The market is sufficiently large to warrant the expenditure of the development funds of the order of a few million dollars in order to get the job done.

The tests should have important motivational and efficiency properties which will warrant their use. Actually, I expect the effects to be even greater than the limited available evidence will allow one to predict on a conservative basis.

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APPENDIX I

SAMPLE STUDENT RECORD FORMS

SUMMARY OF STUDENT INFORMATION FORMS

Permanent Folder - Kept with teacher (advisor) who makes long-term prescriptions

Figure	
A, B, C	Family Background
D	Physical Examination and Health History
E1-	Placement Summary Sheet from Previous Stage
E4	Placement Summary Sheet from Current Stage
F	Basic Learning Skills Summary Sheet (Stage I and II)
G	Long-term Prescription Form - Original Copy

Stage Folder - Retained by student except in Stage I;
Picture and Schedule on the Cover

Figure		
G	Long-term Prescription Form - Duplicate Copy	
H	Objectives Completed to Date	Stage II, III, and IV
I	Test Options Selected	
	Projective Test Results:	
J	Basic Learning Skills Checklist	Stage I and II
K	Vocabulary Checklist	
L	Behavior and Interest Information	Stage II, III, and IV
M	Activities Summary Sheet (Optional)	

Subject Area Folder - One for each Stage II, III, and IV student in each subject area

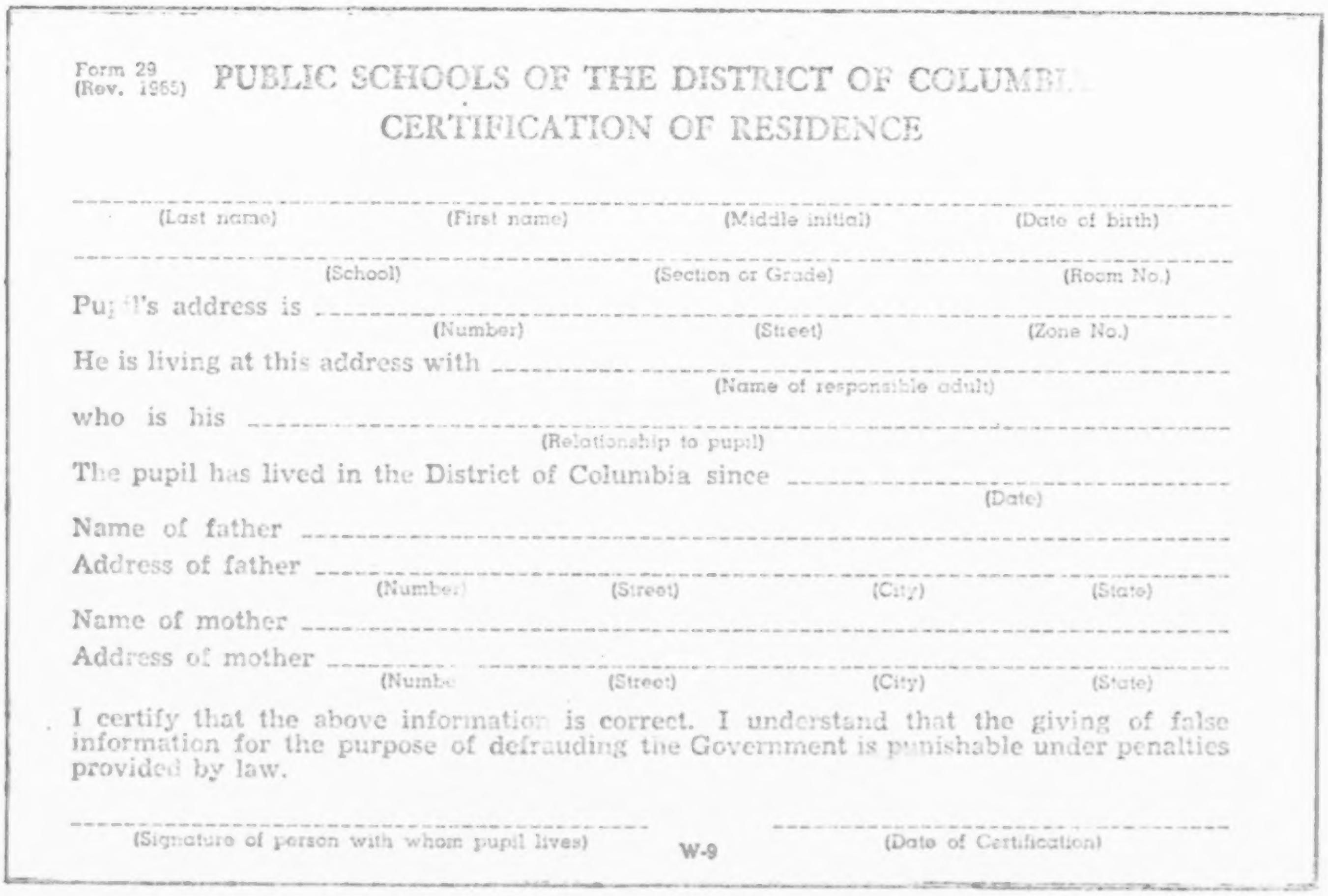
Figure	
N	Short-term Prescription Form (Sample)
O	Suggested Unit Titles
P	Current Year's Work Summary Sheet
Q	Previous Year's Work Summary Sheet

Specifications for Folders: Heavy tag board with horizontal pockets on inside of front and back covers; student's picture and attendance card will be stapled to the front of the Stage Folder.

PERMANENT FOLDER COVER

Student's Name ______________________________

Figure A



Form 29
(Rev. 1955)

PUBLIC SCHOOLS OF THE DISTRICT OF COLUMB

CERTIFICATION OF RESIDENCE

(Last name) (First name) (Middle initial) (Date of birth)

(School) (Section or Grade) (Room No.)

Pupil's address is (Number) (Street) (Zone No.)

He is living at this address with (Name of responsible adult)

who is his (Relationship to pupil)

The pupil has lived in the District of Columbia since (Date)

Name of father

Address of father (Number) (Street) (City) (State)

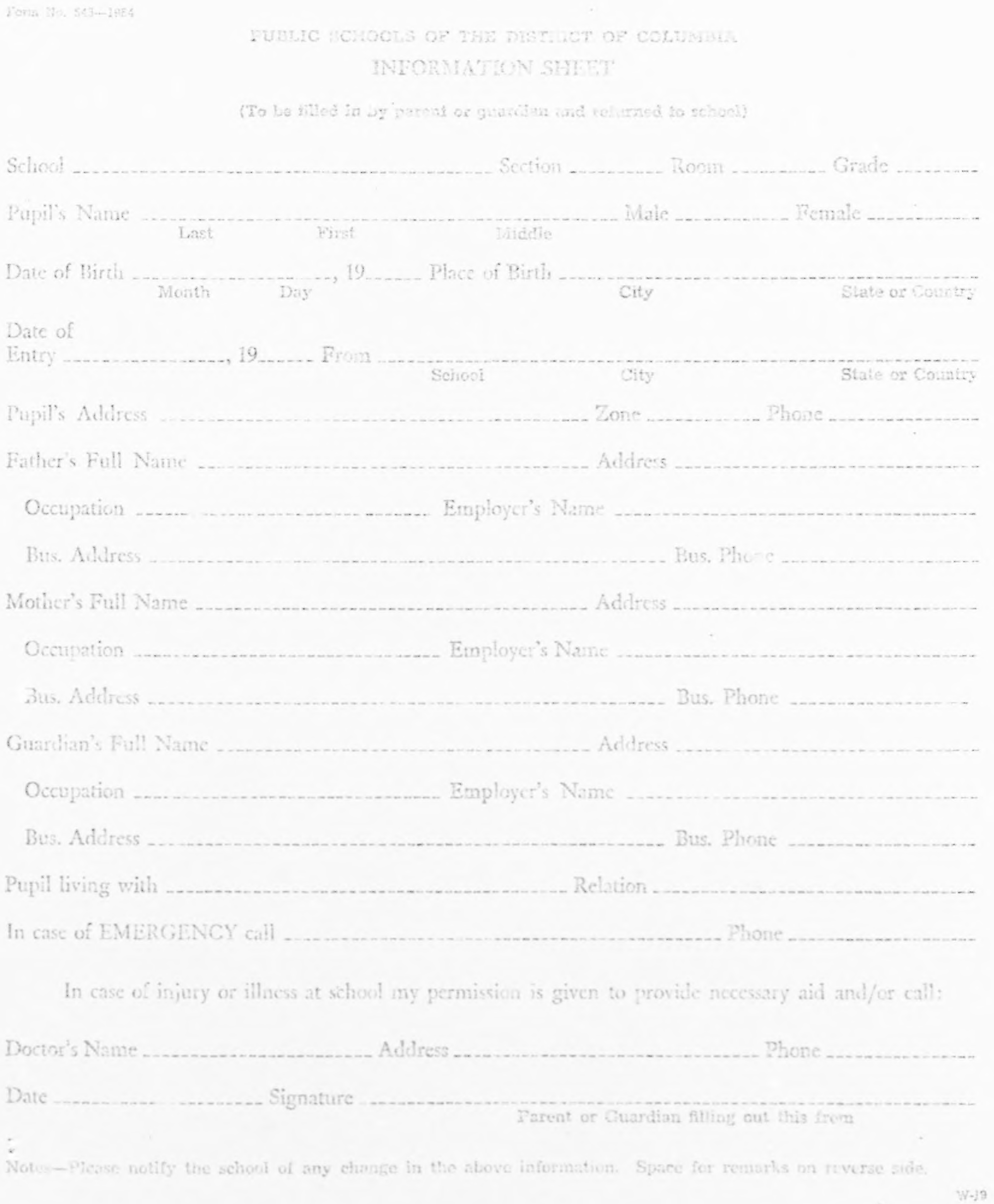
Name of mother

Address of mother (Number) (Street) (City) (State)

I certify that the above information is correct. I understand that the giving of false information for the purpose of defrauding the Government is punishable under penalties provided by law.

(Signature of person with whom pupil lives) W-9 (Date of Certification)

Figure B



Form No. 543—1954

PUBLIC SCHOOLS OF THE DISTRICT OF COLUMBIA

INFORMATION SHEET

(To be filled in by parent or guardian and returned to school)

School ____________ Section ________ Room ________ Grade ________

Pupil's Name ____________ Male ________ Female ________
Last First Middle

Date of Birth ____________, 19____ Place of Birth ____________
Month Day City State or Country

Date of Entry ____________, 19____ From ____________
School City State or Country

Pupil's Address ____________ Zone ________ Phone ________

Father's Full Name ____________ Address ____________

Occupation ____________ Employer's Name ____________

Bus. Address ____________ Bus. Phone ____________

Mother's Full Name ____________ Address ____________

Occupation ____________ Employer's Name ____________

Bus. Address ____________ Bus. Phone ____________

Guardian's Full Name ____________ Address ____________

Occupation ____________ Employer's Name ____________

Bus. Address ____________ Bus. Phone ____________

Pupil living with ____________ Relation ____________

In case of EMERGENCY call ____________ Phone ____________

In case of injury or illness at school my permission is given to provide necessary aid and/or call:

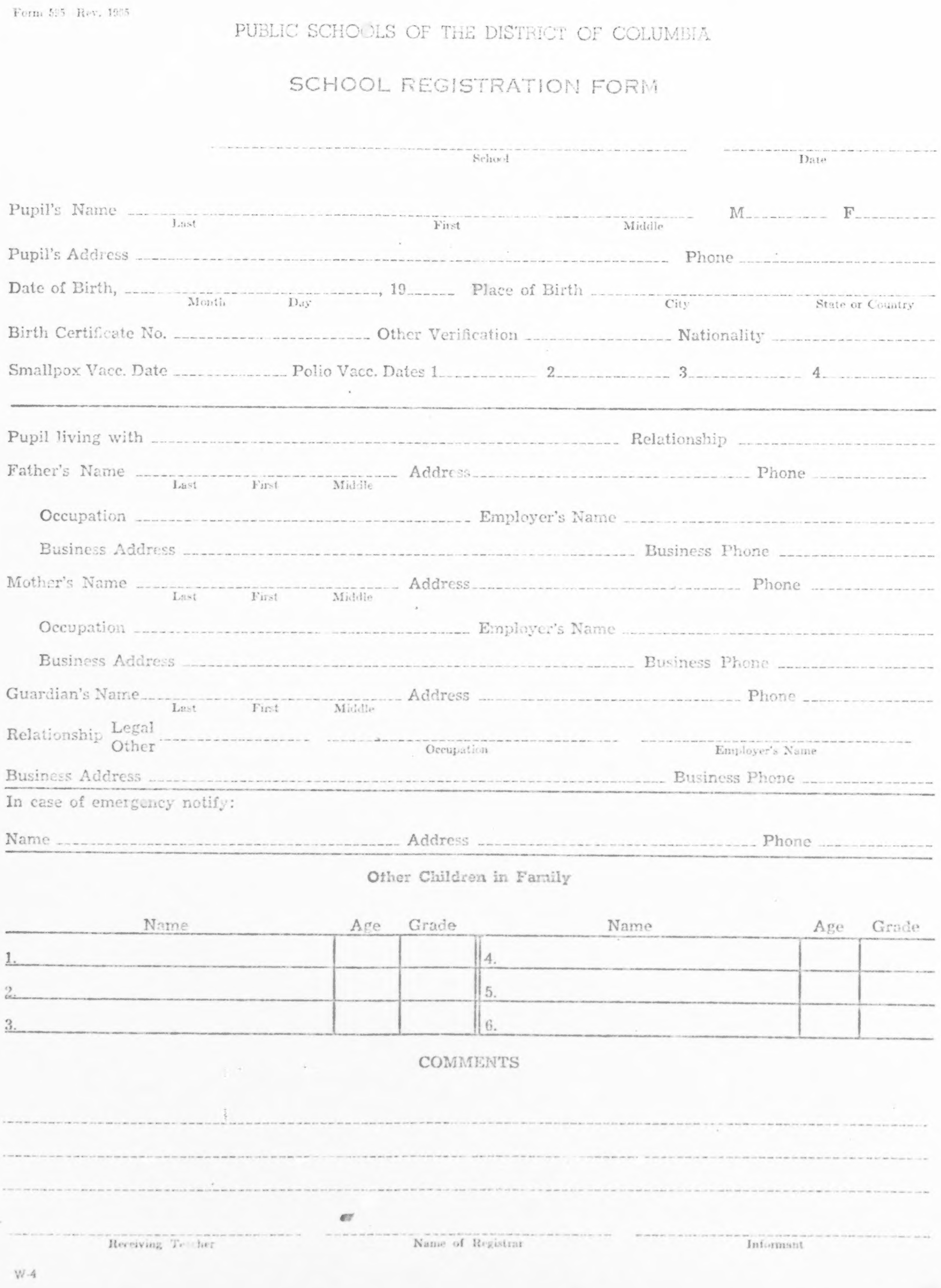
Doctor's Name ____________ Address ____________ Phone ____________

Date ____________ Signature ____________
Parent or Guardian filling out this from

Notes—Please notify the school of any change in the above information. Space for remarks on reverse side.

W-J9

Figure C



Form 595 Rev. 1965

PUBLIC SCHOOLS OF THE DISTRICT OF COLUMBIA

SCHOOL REGISTRATION FORM

School ______ Date ______

Pupil's Name ______ (Last, First, Middle) M______ F______

Pupil's Address ______ Phone ______

Date of Birth, ______ (Month, Day), 19______ Place of Birth ______ (City, State or Country)

Birth Certificate No. ______ Other Verification ______ Nationality ______

Smallpox Vacc. Date ______ Polio Vacc. Dates 1______ 2______ 3______ 4______

Pupil living with ______ Relationship ______

Father's Name ______ (Last, First, Middle) Address ______ Phone ______

Occupation ______ Employer's Name ______

Business Address ______ Business Phone ______

Mother's Name ______ (Last, First, Middle) Address ______ Phone ______

Occupation ______ Employer's Name ______

Business Address ______ Business Phone ______

Guardian's Name ______ (Last, First, Middle) Address ______ Phone ______

Relationship Legal Other ______ ______ (Occupation) ______ (Employer's Name)

Business Address ______ Business Phone ______

In case of emergency notify:

Name ______ Address ______ Phone ______

Other Children in Family

Name	Age	Grade	Name	Age	Grade
1.			4.		
2.			5.		
3.			6.		

COMMENTS

______

______

______

______ Receiving Teacher ______ Name of Registrar ______ Informant

W-4

Figure D

PHYSICAL EXAMINATION
and HEALTH HISTORY

D. C. Forms Will Be Used

Figure E1

Stage I
Placement Summary Sheet

Name ______________________ Age __________

Decision for Placement made by ______________________

Date moved to Stage II ______________________

	Date	Summarized By
1. Works together with another child of his choice for 15 minutes, sharing materials and/or equipment.		
2. Responds to a task or question by making a mark on a paper, selecting a simple object or matching 2 simple objects.		
3. Finds his way around instructional areas to locate familiar objects.		
4. Uses, keeps track of, and puts away when finished playing, 4 large objects likely to be scattered in course of play.		
5. Given a simple task persists in that task for at least 15 minutes.		
6. Given 3 digit span at random, repeats the 3 digits immediately after all 3 are stated.		
7. Given a simple declarative sentence which states an act to be performed, repeats the instruction.		
8. Mastered 500 concepts as indicated by ability to use associated vocabulary words orally.		

Notes:

Figure E2

Stage II
Placement Summary Sheet

Name ______________________________ Age __________

Decision for Placement made by ______________________________

Date moved to Stage III ______________________________

	Date	Summarized By
1. Works in a group with 3-4 other children, not selected by the child for 1/2 hour, sharing materials and/or equipment.		
2. Puts on winter coat, boots, mittens, in 10 minutes.		
3. Deals a standard deck of cards.		
4. Unlocks a door with a simple lock and key.		
5. Cuts finger nails or manipulates simple tools such as scissors, without injuring himself.		
6. Ties shoelaces.		
7. Goes to school alone in daylight hours. Reads stop signs, signal lights, etc.		
8. Operates a Language Master, filmstrip projector, record player, single concept film projector, and cassette tape recorder.		
9. Uses, keeps track of, and puts away materials for required and optional objectives 70% of the time.		
10. Asks for help when source of information is not adequate.		
11. Given a simple task persists in that task for at least 1/2 hour.		
12. Given responsibility for a simple task, carries it to completion.		
13. Given a simple declarative statement requiring an act the student can perform, follows the directions. Time between statement of direction and opportunity to perform should not exceed 3 minutes.		

Figure E2 continued

	Date	Summarized By
14. Dials home phone number from memory.		
15. States address.		
16. Identifies basic colors.		
17. Has mastery of a 1,000 concepts as indicated by abilities to use associated vocabulary words orally.		
18. Writes, prints, or types name without error.		
19. Writes letters when dictated for words of up to 6 letters (no spelling involved).		
20. Speaks in a sentence when requested to do so in response to questions such as "Tell me about the picture" (descriptive sentences only).		
21. Decodes 500 words at 90% proficiency including basic connective words from Dolch list plus any phonetically regular words.		
22. Uses numbers to 100 as an identifying address.		
23. On request, can count or collect any number of objects up to 12.		
24. Completed 10 mathematics objectives.		
25. Completed 10 reading objectives.		
26. Completed 4 communication skills objectives.		
27. Completed 2 health objectives.		
28. Selected 4 arts and humanities objectives.		
29. Selected 6 social studies objectives.		
30. Selected 10 science objectives.		
31. Selected 4 physical education objectives.		
32. Completed 30% of self-selected optional objectives.		

Notes:

Figure E3

Stage III
Placement Summary Sheet

Name ______________________________ Age ____________________

Decision for Placement made by ______________________________

Date moved to Stage IV ______________________________

	Date	Summarized By
1. Participates in a class of up to 60 students for 1 hour a. listens to group instruction b. does not distract other participants c. keeps silent if requested to do so d. takes part in tasks assigned to group		
2. Collates up to 20 pages in proper sequence.		
3. Follows 3 part direction code to open a combination lock.		
4. Reads a simple map of the neighborhood to get a specific location.		
5. Operates a 16mm film projector, records on a tape recorder.		
6. Uses, keeps track of, and puts away materials for required and optional objectives 80% of the time.		
7. Uses reference skills to find information; for example, he uses the card catalogue to locate a book on a given subject.		
8. Follows school rules at least 75% of the time.		
9. Follows directions on a standardized achievement test.		
10. Given a task with partial directions and some procedures for student to decide upon, manages and/or persists in task for 20 minutes.		
11. Turns in completed work which was assigned the previous day.		

Figure E3 continued

Date | Summarized By

12. Speaks in a sentence when requested to do so in response to questions seeking descriptions and/or logical connections such as cause and effect.

13. Answers questions regarding factual information given in a one paragraph reading selection the student can decode.

14. Draws a scene or makes a diagram which is recognizable at a later date to the student and to others as a method of recording an observation.

15. Reads a 12 hour clock.

16. Completed 20 mathematics objectives.

17. Completed 15 reading objectives.

18. Completed 6 communication skills objectives.

19. Completed 4 health objectives.

20. Selected 6 arts and humanities objectives.

21. Selected 8 social studies objectives.

22. Selected 15 science objectives.

23. Selected 6 physical education objectives.

24. Completed 40% of self-selected optional objectives.

Notes:

Figure E4

Stage IV
Placement Summary Sheet

Name ______________________ Age ______________

Decision for Placement made by ______________________

Date ready for Graduation ______________________

	Date	Summarized By
1. Participates in a discussion as a member of an assigned group, contributing information but not dominating the group, tolerating differences of opinion, and building on the ideas of others.		
2. Uses various sources of information and tools to check the validity of data.		
3. Given task, decides upon procedures to be used to complete the task and manages and/or persists in task for 1/2 hour.		
4. Given an assignment to be completed within 6 days, completes the assignment within the allotted time.		
5. Given 4 related, dependent, sequential, meaningful operations extending over at least 10 minutes when both the language and operations are known to be in the student's repertoire, student completes the task; student may write down directions if he chooses.		
6. Listens to and relays a meaningful message when the content and language used in the message are known to be within the student's repertoire. Time delay of not more than 5 minutes.		
7. Completed mathematics required terminal objectives.		
8. Completed reading required terminal objectives.		
9. Completed communication skills required terminal objectives.		

Figure E4 continued

	Date	Summarized By
10. Completed health required terminal objectives.		
11. Selected 8 arts and humanities objectives.		
12. Selected 12 social studies objectives.		
13. Selected 20 science objectives.		
14. Selected 6 physical education objectives.		
15. Completed 60% of self-selected optional objectives.		

Notes:

Figure F

BASIC LEARNING SKILLS

Summary Sheet

When all the minimum skills on a checklist have been demonstrated to the established proficiency, cross off the corresponding category on the list below with a highlight pen and discard the checklist.

1. Observing
2. Listening
3. Expanding vocabulary
4. Improving memory
5. Recognizing characteristics
6. Classifying
7. Solving problems
8. Predicting and testing
9. Touching
10. Understanding shapes
11. Knowing color
12. Speaking
13. Following directions
14. Counting
15. Understanding numbers
16. Telling time
17. Measuring
18. Sticking to a task
19. Understanding rules
20. Tasting and smelling
21. Finger dexterity
22. Drawing
23. Making and building
24. Using tools
25. Knowing the alphabet
26. Relations with others
27. Self-care and safety
28. Understanding "What?"
29. Understanding "Where?"
30. Understanding "When?"
31. Understanding "Why?"
32. Understanding "How?"
33. Understanding "Who?"
34. Making sounds and music
35. Physical coordination

STAGE FOLDER COVER

Name ______________________________

Stage ______________________________

Arrival at School: 7:30 8:00 8:30
9:00 9:30 10:00

Days at School: M T W Th F S

Student's

Photo

Figure II

Objectives Completed to Date

Mathematics

Required _______ _______ _______ _______ _______ _______ _______
Year's Goal _______ _______ _______ _______ _______ _______ _______
Optional _______ _______ _______ _______ _______ _______ _______
Year's Goal _______ _______ _______ _______ _______ _______ _______

Reading

Required _______ _______ _______ _______ _______ _______ _______
Year's Goal _______ _______ _______ _______ _______ _______ _______
Optional _______ _______ _______ _______ _______ _______ _______
Year's Goal _______ _______ _______ _______ _______ _______ _______

Communication Skills

Required _______ _______ _______ _______ _______ _______ _______
Year's Goal _______ _______ _______ _______ _______ _______ _______
Optional _______ _______ _______ _______ _______ _______ _______
Year's Goal _______ _______ _______ _______ _______ _______ _______

Health

Required _______ _______ _______ _______ _______ _______ _______
Year's Goal _______ _______ _______ _______ _______ _______ _______
Optional _______ _______ _______ _______ _______ _______ _______
Year's Goal _______ _______ _______ _______ _______ _______ _______

Figure II continued

Objectives Completed to Date

Science

Minimum _______ _______ _______ _______ _______ _______ _______

Year's Goal _______ _______ _______ _______ _______ _______ _______

Additional _______ _______ _______ _______ _______ _______ _______

Year's Goal _______ _______ _______ _______ _______ _______ _______

Arts and Humanities

Minimum _______ _______ _______ _______ _______ _______ _______

Year's Goal _______ _______ _______ _______ _______ _______ _______

Additional _______ _______ _______ _______ _______ _______ _______

Year's Goal _______ _______ _______ _______ _______ _______ _______

Social Studies

Minimum _______ _______ _______ _______ _______ _______ _______

Year's Goal _______ _______ _______ _______ _______ _______ _______

Additional _______ _______ _______ _______ _______ _______ _______

Year's Goal _______ _______ _______ _______ _______ _______ _______

Physical Education

Minimum _______ _______ _______ _______ _______ _______ _______

Year's Goal _______ _______ _______ _______ _______ _______ _______

Additional _______ _______ _______ _______ _______ _______ _______

Year's Goal _______ _______ _______ _______ _______ _______ _______

Figure I

Test Options Selected

Mathematics

Unit						
Option						

Reading

Unit						
Option						

Science

Unit						
Option						

Communication Skills

Unit						
Option						

Social Studies

Unit						
Option						

Arts and Humanities

Unit						
Option						

Health

Unit						
Option						

Figure J

Basic Learning Skills Checklist
Unit 26.00 Relations with Others
(See next page for directions.)

End Reg. Obs.	Skill												
(x)	Readily parts from mother.												
(x)	Accepts guidance by an adult other than mother.												
	Smiles when meeting a new acquaintance.												
	Says "Hello," or offers to shake hands when meeting someone new.												
	Smiles or laughs at jokes or funny situations.												
(x)	Accepts reasonable opposition without crying or sulking.												
(x)	When opposed, does not give way to a temper tantrum.												
	Does not "tattle" unnecessarily on other children.												
(x)	Does not hit or kick other children.												
	If asked by another child, will give him toy or other material.												
	When asked by an adult, will give a toy or other material to another child.												
(x)	Asks permission before taking a toy or other material being used by another child.												
	Asks adult permission before doing something other children are not doing.												
	In game with other children, waits to take own turn in order.												
(x)	Does not interrupt another child to express his own views during a group activity.												
	Joins in games with other children.												
	Freely talks with other children.												
	Helps another child accomplish a task.												
	Offers to help adult do something.												
	When asked, willingly carries out a simple chore for an adult.												
	Tries to win at group games.												
	Does not try to cheat to win at a game.												
	Usually says, "Please."												
	Usually says, "Thank you."												
	Usually says, "You're welcome."												
	Usually says, "Pardon me."												
	Does not push and shove when standing in line.												
(x)	Does not try to bully younger or weaker children.												
	Stands aside to let an adult go through a door first.												
	Makes own opinions known in group discussion.												
	Contributes to group discussion on how to do or build something.												
	Gives reasons for a statement in group discussion.												
	Gives examples or definitions to support an argument in discussion.												

(x) Denotes minimum skill.

Figure J continued

End Reg. Obs.	Skill												
	Tells a group about a favorite toy, vacation, etc.												
	Tells a simple story to a group.												
	Describes something to a group, such as his bedroom at home.												
	Acts a part in a pantomime play.												
	Acts a speaking part in a puppet play with other children.												
	Acts a speaking part in a "dress-up" play with others.												
(x)	Does not come to an adult unnecessarily to solve minor problems.												
	Makes up own mind without help in solving simple problems.												
(x)	Persists at a task in the face of difficulties.												

Directions: On date of first observation of any skill on this checklist, enter date in space at top of the first right hand column. In the box opposite each observed skill, enter initials. Repeat the procedure for observations on subsequent dates. When the skill has been observed to a satisfactory proficiency, place a check in the left hand column headed "End Regular Observation."

Figure K

Vocabulary Checklist

One of the recommended criteria for progression of students from Stage I to Stage II is mastery of 500 concepts as represented by vocabulary words. Mastery of 1000 concepts is one of the criteria for progression from Stage II to Stage III. For a complete list of criteria for all stages, see Forms E1, E2, E3, and E4 in Appendix I.

The Vocabulary Checklist is suggested as a means of recording these concepts. The words on the list were selected because they are most likely to be in a preschool youngster's repetoire. The list is not intended as exhaustive. Space is provided to enter unlisted words a child knows or the teacher wishes to add. The 853 words are grouped under 20 headings arranged alphabetically as are the words within each group. A list of headings and the page on which each starts follows this introduction.

As a way of checking that vocabulary is being developed in all areas, it is suggested that every child be required to master a minimum number of words in each group (except Time). This number is in parentheses on the page listing of all headings, and at the top of the first column of words in each group in the list itself.

The column headed "V" is checked when the child verbalizes a word. The column headed "M" is checked when the child demonstrates mastery. That is, given the word, the student is able to point to an object or a picture representing the word, perform the indicated action, or define the word briefly. A check in this column indicates mastery.

An asterisk indicates the words every child should know because they are important to his health and safety (stop, hot) or they are useful for continued learning (listen, begin, turn).

The mastery of commonly used words relating to color, number and part of the body can be observed or tested readily in relation to other learning activities. A word box is a useful device for collecting the less common words a child is learning. Each child is given a cardboard box large enough to hold index cards. Whenever he asks what a word means, the adult or older student who explains the word writes it on a card and the child puts it in his word box. Periodically an aide or teacher can look at these cards and test the child on their meaning. Words the child has mastered are checked under "M" on the Vocabulary List. The cards are initialed to indicate that testing has been successfully completed.

Contents

(By Word Group Title)*

Page

- Action Words (15) 1
- Animals (5) 2-3
  - Farm 2
  - Zoo 2
  - Pets 2
  - Insects & Wild Animals 2
  - Food and Shelter 2
  - Sounds 3
- Body Parts (10) 3
- Business (5) 3-4
  - General 3
  - Occupations 4
  - Places of 4
- Clothing (5) 4
- Colors (7) 5
- Communications (5) 5
- Conditions (5) 5-6
- Foods (5) 6-7
  - Meat 6
  - Fruit 6
  - Desserts 6
  - Milk and Dairy Products 6
  - Grains 6
  - Miscellaneous 6
  - Vegetables 7
  - Meals and Utensils 7
- Health and Cleanliness (1) 7
- Home Furnishings (5) 7
- Nature (5) 8
- Number and Amount (10) 8
- People (5) 8-9
  - General 8
  - Family 8
  - Community 9
  - National 9
- Position (5) 9
- Shapes and Sizes (5) 9
- Shelter (3) 10
- Time 10
- Toys and Materials (5) 10
- Transportation (5) 10-11

---

* Numbers in parentheses are required minimums for that group.

1

GROUP	V	M
Action Words[1]	#	15
Act		
Ate		
Beat		
Begin*		
Began		
Begun		
Belong		
Bend		
Bit		
Bite		
Bring		
Broke		
Broken		
Brought		
Came		
Carry		
Change		
Climb		
Come		
Cook		
Cry		
Cut		
Draw		
Drink		
Drop		
Eat		
Fall		
Fell		
Find		
Finish*		
Fit		
Fix		
Follow		
Found		
Gave		
Get		
Give		
Go*		
Gone		
Got		
Heat		
Hit		
Hold		
Hunt		

GROUP	V	M
Action Words	#	
Jump		
Kick		
Knock		
Lay		
Laid		
Leave		
Lead		
Led		
Let		
Lie		
Lift		
Live		
Listen*		
Look*		
Made		
Make		
Meet		
Met		
Miss		
Need		
Open		
Pass		
Pick		
Point*		
Pull		
Push		
Put		
Ran		
Rest		
Roll		
Run		
Sat		
Save		
See		
Send		
Sent		
Set		
Shake		
Show*		
Shut		
Sing		
Sit*		
Smell		
Smile		

GROUP	V	M
Action Words	#	
Speak		
Stand*		
Start*		
Stay		
Stop*		
Take*		
Talk		
Taste		
Tell		
Took		
Touch		
Try		
Turn*		
Use		
Wait		
Wake		
Walk		
Wave		
Went		
Work		
Write		
Yell		

---

[1] Regular forms of verbs are listed in the present tense only. Irregular forms of verbs may be listed in several tenses.

GROUP	V	M
Animals	#	5
Farm Animals		
Chicken		
Cow		
Donkey		
Duck		
Goat		
Goose		
Horse		
Pig		
Sheep		
Turkey		
Zoo Animals		
Alligator		
Bear		
Camel		
Crocodile		
Elephant		
Giraffe		
Hippopotamus		
Kangaroo		
Leopard		
Lion		
Monkey		
Rhinoceros		
Snake		
Tiger		
Zebra		

GROUP	V	M
Animals	#	
Pets		
Canary		
Cat		
Dog		
Gerbil		
Goldfish		
Hamster		
Kitten		
Parakeet		
Parrot		
Puppy		
Turtle		
Insects and Wild Animals		
Ant		
Bee		
Bird		
Butterfly		
Chipmunk		
Deer		
Fish		
Fly		
Fox		
Frog		
Mosquito		
Mouse (mice)		
Moth		
Owl		
Porcupine		
Rabbit		
Raccoon		
Rat		
Roach		
Skunk		
Spider		
Squirrel		
Wolf		
Worm		

GROUP	V	M
Animals	#	
Farm Animals Food and Shelter		
Barn		
Farm		
Hay		
Oats		
Shed		
Zoo Animal Shelter		
Desert		
Jungle		
Pet Shelter		
Aquarium		
Cage		
Fishbowl		
Pond		
Wild Animal Shelter		
Field		
Forest		
Meadow		
Nest		
Stream		
Swamp		

GROUP	V	M
Animals	#	
Farm Animal Sounds[1]		
Baa		
Cock-a-doddle-doo		
Gobble		
Moo		
Neigh		
Oink		
Zoo Animal Sounds		
Hiss		
Roar		
Pet Sounds		
Bark		
Chirp		
Growl		
Meow		
Purr		

GROUP	V	M
Body Parts	#	10
Arm		
Beard		
Bone		
Body		
Cheek		
Chest		
Chin		
Ear*		
Elbow		
Eye*		
Face*		
Finger		
Fingernail		
Foot*		
Hair		
Hand		
Heart		
Head*		
Heel		
Hips		
Knee		
Leg*		
Lips		
Mouth*		
Muscle		
Neck		
Nose*		
Skin		
Teeth		
Toe		
Toenail		
Tongue		

GROUP	V	M
Business	#	5
Bill		
Borrow		
Buy		
Charge		
Check		
Cost		
Dime		
Dollar		
Factory		
Farm		
Loan		
Money		
Nickel		
Pay		
Penny		
Quarter		
Shop		
Spend		

---

[1] Animal sounds must be stated as words (growl not grrr...) and identified with an animal.

GROUP	V	M
Business	#	
Occupations		
Actor		
Architect		
Artist		
Astronaut		
Babysitter		
Barber		
Beautician		
Boss		
Butcher		
Carpenter		
Cleaner		
Cook		
Dancer		
Druggist		
Electrician		
Engineer		
Farmer		
Fisherman		
Grocer		
Lawyer		
Librarian		
Maid		
Mechanic		
Musician		
Newsboy		
Painter		
Photographer		
Pilot		
Plumber		
Priest		
Rabbi		
Reporter		
Salesman		
Scientist		
Secretary		
Singer		
Teacher		
Veternarian		
Waiter		
Zoo Keeper		
Minister		

GROUP	V	M
Business	#	
Places of		
Bank		
Bar		
Barber Shop		
Beauty Salon		
Carry Out		
Factory		
Farm		
Office		
Restaurant		
Shop		
Station		
Store		
Supermarket		
Theater		

GROUP	V	M
Clothing	#	5
Apron		
Bathing Suit		
Belt		
Bib		
Blouse		
Boots		
Button		
Cap		
Coat		
Diapers		
Dress		
Gloves		
Hat		
Jacket		
Jeans		
Jumper		
Mittens		
Nightgown		
Pajamas		
Pants		
Purse		
Robe		
Sandals		
Scarf		
Shoes		
Shoelaces		
Shorts		
Skirt		
Slippers		
Socks		
Stocking		
Suit		
Sweater		
Tie		
Underwear		
Vest		
Zipper		

GROUP	V	M
Colors	#	7
Black*		
Blue*		
Brown		
Color		
Gold		
Gray		
Green		
Orange		
Pink		
Purple		
Red*		
Silver		
White*		
Yellow*		

GROUP	V	M
Communication	#	5
Bell		
Book		
Camera		
Chalk		
Chalkboard		
Chart		
Clock		
Crayon		
Drum		
Earphones		
Filmstrip		
Fire Gong		
Flannelboard		
Globe		
Guitar		
Horn		
Language Master		
Letter		
Magazine		
Map		
Mirror		
Movie		
Newspaper		
Pencil		
Photograph		
Piano		
Picture		
Radio		
Record Player		
Tape Recorder		
Telephone		
Television		
Typewriter		

GROUP	V	M
Conditions	#	5
Afraid		
Alike		
Alive		
Alone		
Bad		
Beautiful		
Brave		
Busy		
Careful		
Cold		
Dangerous		
Dark		
Dead		
Different		
Dry		
Empty		
Fast		
Fat		
Full		
Fun		
Funny		
Glad		
Good		
Hard		
Happy		
High		
Hot *		
Hungry		
Lazy		
Light		
Like		
Lost		
Loud		
Love		
Low		
Lucky		
Mad		
Mean		
New		
Nice		
Noisy		
Old		
Open		
Poor		

GROUP	V	M
Conditions	#	
Pretty		
Promise		
Quiet		
Ready		
Real		
Rich		
Right		
Sad		
Safe		
Same		
Scared		
Silly		
Slowly		
Soft		
Sorry		
Strong		
Surprise		
Sweet		
Tired		
Warm		
Weak		
Well		
Wet		
Wrong		
Young		

GROUP	V	M
Foods	#	5
Meat		
Bacon		
Bologna		
Chicken		
Fish		
Ham		
Hamburger		
Hot Dog		
Pork Chop		
Sausage		
Steak		
Fruits		
Apple		
Banana		
Berry		
Grape		
Grapefruit		
Lemon		
Peach		
Pear		
Pineapple		
Plum		
Orange		
Desserts		
Cake		
Candy		
Cookies		
Frosting		
Jello		
Pie		
Pudding		

GROUP	V	M
Foods	#	
Milk and Dairy Products		
Butter		
Cheese		
Cottage Cheese		
Eggs		
Milk		
Ice Cream		
Grains		
Bread		
Cereal		
Cracker		
Flour		
Macaroni		
Oats		
Popcorn		
Rice		
Roll		
Spaghetti		
Toast		
Wheat		
Miscellaneous		
Catsup		
Coffee		
Gravy		
Gum		
Mustard		
Peanut Butter		
Pepper		
Pizza		
Potato Chips		
Salad		
Salt		
Sandwich		
Soda		
Soup		
Sugar		
Water		

GROUP	V	M
Food	#	
Vegetables		
Beans		
Beets		
Broccoli		
Cabbage		
Carrot		
Celery		
Corn		
Lettuce		
Onions		
Peas		
Pepper		
Potato		
Pumpkin		
Radish		
Tomato		
Spinach		
Meals and Utensils		
Bowl		
Breakfast		
Cup		
Dinner		
Dish		
Fork		
Glass		
Knife		
Lunch		
Napkin		
Pan		
Pitcher		
Plate		
Pot		
Saucer		
Spoon		
Supper		

GROUP	V	M
Health & Cleanliness	#	1
(One word required to indicate illness)		
Accident		
Ache		
Bandaid		
Bandage		
Bath		
Brush		
Bleed		
Blood		
Clean		
Comb		
Cough		
Cut		
Dentist		
Dirty		
Doctor		
Hospital		
Medicine		
Nurse		
Pain		
Pill		
Sick		
Sleep		
Sneeze		
Soap		
Sore		
Strong		
Tired		
Toothbrush		
Tub		
Wake		
Wash		
Well		

GROUP	V	M
Home Furnishings	#	5
Bathtub		
Bed		
Broom		
Chair		
Chimney		
Clock		
Closet		
Couch		
Cupboard		
Curtain		
Dining room		
Door		
Floor		
Garage		
Hall		
Key		
Kitchen		
Lamp		
Light		
Living room		
Lock		
Mirror		
Pillow		
Refrigerator		
Roof		
Rug		
Sink		
Sofa		
Stairs		
Stove		
Table		
Toilet		
Wall		
Window		

GROUP	V	M
Nature	#	5
Autumn		
Cloud		
Dirt (Soil)		
Earth		
Fall		
Flower		
Garden		
Grass		
Lake		
Moon		
Plant		
Rain		
River		
Rock		
Sky		
Snow		
Space		
Spring		
Star		
Summer		
Sun		
Tree		
Weed		
Wind		
Winter		

GROUP	V	M
Number & Amount	#	10
All		
Another		
Any		
Both		
Eight*		
Every		
Everything		
Extra		
Few		
Five*		
Four*		
Group		
Less		
Many		
More		
Much		
Nine*		
None		
Nothing		
Number		
One*		
Only		
Other		
Part		
Piece		
Seven*		
Several		
Six*		
Some		
Ten*		
Three*		
Two*		

GROUP	V	M
People	#	5
General		
Baby*		
Boy		
Child		
Children		
Friend		
Girl		
Lady		
Man		
Person		
Woman		
Us		
Me, I		
We		
You		
They		
Family		
Aunt		
Brother*		
Cousin		
Daddy		
Daughter		
Father*		
Grandfather		
Grandpa		
Grandmother		
Grandma		
Husband		
Kin		
Mama, mom,		
Mother*		
Pa, papa		
Parents		
Sis, sister		
Son		
Uncle		
Wife		

GROUP	V	M
People	#	
Community		
Fireman		
Garbage Collector		
Judge		
Mailman		
Policeman		
National		
King		
President		
Queen		
Sailor		
Soldier		

GROUP	V	M
Position	#	5
Above		
Across		
After		
Against		
Around		
Back		
Backward		
Before		
Behind		
Below		
Beside		
Betw[illegible]n		
Bot[illegible]		
Down		
End		
Far		
Forward		
Front		
Here		
In		
Inside		
Into		
Left		
Near		
Off		
On		
Out		
Outside		
Over		
Right		
Sideways		
There		
Through		
To		
Top		
Under		
Up		
Within		
Without		

GROUP	V	M
Shapes & Size	#	5
Big		
Box		
Circle*		
Cone		
Cube		
Flat		
Line*		
Little		
Long		
Shape		
Short		
Size		
Small		
Square*		
Straight		
Tall		
Triangle		

GROUP	V	M
Shelter	#	3
Apartment		
Church		
Highrise		
Hotel		
Home		
House		
Townhouse		
Trailer		
Hospital		
Building		
School		

GROUP	V	M
Time	#	
Clock		
Day		
Early		
Evening		
Late		
Morning		
Now		
Time		
Today		
Tomorrow		
Week		
Yesterday		

GROUP	V	M
Toys & Materials	#	5
Animal		
Ball		
Bat		
Bean Bag		
Blocks		
Clay		
Crayon		
Doll		
Game		
Gun		
Hammer		
Jump rope		
Metal		
Nail		
Paint		
Paper		
Paste		
Pencil		
Plastic		
Puppet		
Puzzle		
Scissors		
Shovel		
String		
Tape		
Wire		
Wood		

GROUP	V	M
Transportation	#	5
Airplane		
Alley		
Automobile		
Bicycle		
Boat		
Bridge		
Bus		
Car		
Driveway		
Elevator		
Escalator		
Highway		
Jet		
Path		
Road		
Rocket		
Sidewalk		
Spaceship		
Street		
Train		
Truck		
Tunnel		
Wagon		

GROUP	V	M
	#	

GROUP	V	M
	#	

Figure L

Behavior and Interest Information

Name ______________________________ __________ Age __________

Behavior	Formal Projective Test	Informal Projective Test
Tolerance		
Persistence in the Face of Frustration		
Acceptance of Criticism		
Ability to Relax		
Self-Confidence		
Attention Span		

Notes: ____

____

____

____

Interests:

____________________	____________________
____________________	____________________
____________________	____________________
____________________	____________________
____________________	____________________
____________________	____________________
____________________	____________________
____________________	____________________
____________________	____________________

Figure M

Activities Summary Sheet
(Optional)

Month ______________________________

Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Work Pages																										
Books																										
Films																										
Film-strips																										
Tapes																										
Games																										
Ind. Study																										
Tutored by Peer																										
Tutored Peer																										
Other (list)																										

Note on use: Student counts up total days per activity from assignment sheet by subject area and colors in total days on an activity for a subject area.

Color code:

Reading	Red
Mathematics	Blue
Social Studies	Green
Science	Yellow
Communication Skills	Orange
Arts & Humanities	Brown
Physical Education	Purple
Health	Black

SUBJECT AREA FOLDER COVER

Student's Name ______________________

Figure N

Name ______________________ Advisor ______________________

Terminal Objective Names and identifies numerals from 1 to 10. Matches equivalent and non-equivalent sets.

Level or Stage A Unit Numeration

Unit Tests
(Hi-Lo Prof. Crit. ______)

		Pre 1	Post 1	2	3
Score					
	%				
	Date				

Assignments

Date Pres.	Pres. Init.	Activity	Page, Part	Inter. Obj.	Score	Sc's Init.	Remarks

Figure O

Suggested Unit Titles

The subject matter at Fort Lincoln is divided into units for purposes of record keeping and short term prescriptions. Units may vary in length but usually they will incorporate all intermediate objectives under a given terminal objective.

- Discovery

    Observing
    Listening
    Expanding Vocabulary
    Improving Memory
    Recognizing Characteristics
    Classifying
    Solving Problems
    Predicting and Testing
    Touching
    Understanding Shapes
    Knowing Color
    Speaking
    Following Directions
    Counting
    Understanding Numbers
    Telling Time
    Measuring
    Sticking to a Task
    Understanding Rules
    Tasting and Smelling
    Finger Dexterity
    Drawing
    Making and Building
    Using Tools
    Knowing the Alphabet
    Relations With Others
    Self-Care and Safety
    Understanding "What"
    Understanding "When"
    Understanding "Where"
    Understanding "Why"
    Understanding "How"
    Understanding People
    Making Sounds and Music
    Physical Coordination

- Reading

Visual Discrimination
Auditory Discrimination
Literal Comprehension
Interpretive Comprehension
Evaluative Comprehension
Library Skills
Related Reading
Vocabulary Development
Reference Skills
Structural Analysis
Organization Skills

- Communications Skills

Writing (Writing 1, 3, 5, 6)
Spelling (Writing 2)
Typing (Writing 4)
Listening (Listening 7-9)
Speaking (Speaking 10-13)
Observing (Observing 14-18)

- Mathematics

Numeration
Addition
Subtraction
Multiplication
Division
Fractions
Place Value
Money
Time
Systems of Measurement
Geometry
Special Topics
Combination of Processes

- Social Studies

Social Values (1-11)
Social Research (12-17)
Geography Skills (18-23)
History Skills (24-26)
Social Skills (27-32)
Globalism (33-34)
Land Forms (35)
Climate (36-37)
Patterns of Diversity and Similarity (38)

Change (39)
Urbanization (40)
World History (41-43)
Exploration (44)
American History (45-49)
Wants and Choices (50)
Consumption and Production (51 & 54)
Careers (52)
Money (53)
Technology (55-56)
Modified Market Economy (57)
Forms of Government (58)
Comparative Government (59)
American Governing Institutions (60)
Rights (61-62)
Policy Making (63)
Public Opinion (64)
Political Parties (65)
Interest Groups (66)
Conflict (67)
Anthropology (68-69)
Archaeology (70)
Sociology (71-72)
Culture Change (73)
*Black Studies (66.03, 67.08, 68.08, 71.05-.08, 72, 73)

- Arts and Humanities

Visual Arts
Music
Literature
Dance
Drama
Architecture and Urban Studies

- Health

Safety (1-2)
First Aid (3 & 11)
Disease (4-6)
Nutrition (7)
Anatomy (8)
Addiction (9)
Medicine and Advertising (10)

---

* Objectives which can be used as outline for a Black Studies Unit.

- Science

  Observing
  Space/Time
  Numbers
  Measuring
  Classifying
  Communicating
  Predicting
  Inferring

- Physical Education

  Gymnastics (1-3)
  Swimming (4-5)
  Group Sports (6)

Figure P

Current Year's Work Summary Sheet

Activity	Unit				
Tests					
Pretest					
Posttest					
Comp. Diag.					
Improvement					
Days Worked					
Dates					
Option Selected					
Learning Medium					
Work Pages					
Books					
Films					
Filmstrips					
Tapes					
Games					
Ind. Study					
Tutored by Peer					
Tutored Peer					
Other (list)					

Figure Q

Previous Year's Work Summary

Year ______

Unit Name					
Pretest					
Posttest					
Comp. Diag. Test					
Improve. Test					
Days Worked					

Year ______

Unit Name					
Pretest					
Posttest					
Comp. Diag. Test					
Improve. Test					
Days Worked					

Year ______

Unit Name					
Pretest					
Posttest					
Comp. Diag. Test					
Improve. Test					
Days Worked					

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